

DECEMBER 14, 1935

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Railway Age

FOUNDED IN 1856

Modern When Built in 1922
but in need of heavy repairs today

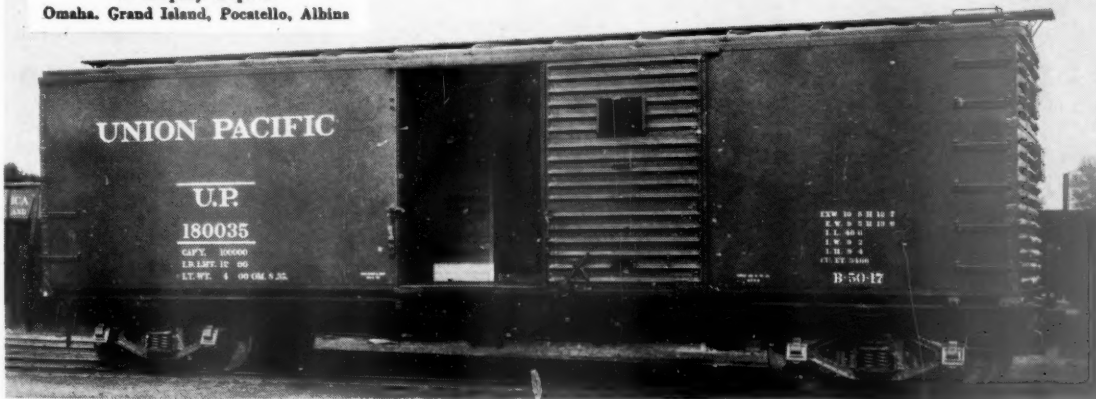
A photograph taken in 1935 of one of 2000 Steel Underframe Box Cars
Built by Union Pacific in 1922
Prior to rebuilding into all-steel box cars with
Youngstown Steel Sides

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Modernized When Repaired in 1935
with Youngstown Steel Sides and Doors

Youngstown Steel Sides and Doors
as applied in 1935 to
1970 Union Pacific Box Cars
in company shops at
Omaha, Grand Island, Pocatello, Albina



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YOUNGSTOWN STEEL DOOR COMPANY
Cleveland Chicago New York Youngstown



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RAILWAY AGE

A Timely Text on Government Ownership

At a time when government ownership of railroads of the United States is seriously advocated by powerful politicians and is foreseen as an eventuality by many who do not favor it, the publication of the biographical "Tragedy of Henry Thornton"* is most opportune. Persons interested in ascertaining how such a policy will work in a democracy under Anglo-Saxon political traditions do not have to base their conclusions upon abstractions, or upon experience under the totally different conditions of dictatorships. In Canada political and economic conditions and railway methods are so closely parallel to those of the United States that Canada's experience with government ownership unquestionably indicates what would happen under a similar policy in this country.

The vitally important question regarding the expediency of government ownership in this country is as to the extent to which efficiency, economy and honesty in management would be affected by politics. In Canada politics are generally on a higher plane than in this country. Sir Henry Thornton accepted the chairmanship and presidency of the government-owned Canadian National system upon the most express and binding assurances that there would be no political interference with management. The board of directors was created and appointed in such a way to provide every practicable safeguard against political interference. But democracy is democracy, and politics is the very essence of democratic government, and can not be excluded from any branch or agency of it.

Political Baiting of Government Railway Officers

The facts—largely taken "from the record"—as outlined in this book should be an answer to anyone who has any doubts about the inevitability of the intrusion of politics into the management of a government-owned railway in a democratic country. Sir Henry Thornton denied more than once that his policies had been interfered with by either the Liberal administration which engaged his services, or the Conservative

administration which asked for his resignation. At the same time, it would be impossible, in the light of directly quoted testimony in this book, to deny that there was political animus on the part of some of the members of the Parliamentary committee which conducted the inquisition into the affairs of the Canadian National Railways in 1932 which resulted in Sir Henry's resignation; or to deny that the nature of much of that inquiry was entirely unjustifiable from any standpoint except that of political expediency. Details of operating expenses which could not be understood out of their context were made the basis of questions, the publication of which in the press could not fail to place the operations of the property in an unfair and inaccurate light before the public. Expense accounts of officers of the system were drawn into testimony in such a way as to imply extravagance, whether it existed or not. Other similar political devices were used to present the case in an unfavorable light—to be sure, with a great deal more civility than frequently characterizes such "fishing expeditions" in our own national capital.

Of course, such questioning of an executive for the public record about detailed operations, which are not comprehensible to the lay mind, is political interference with management in its worst and most obvious form. In a popular democracy, which the United States is to an even greater degree than Canada, such baiting of responsible and honest public servants is a standard device whereby politicians coming into power seek to discredit the acts of their predecessors. That investigations of this character occasionally uncover facts that ought to be known is beside the point—which is that the device is used regularly for all it is worth whether there is any justification for it or not.

An "Inherent Disadvantage of State-Owned Enterprises"

In the light of hindsight many of the capital expenditures made by the Canadian National Railways under the management of Sir Henry Thornton appear unwise and extravagant. Perhaps some of them should have appeared so at the time they were in-

* By D'Arcy Marsh. Published by the Macmillans in Canada, Toronto. Price in U. S. \$3.75.

curred. Be that as it may, a political Administration loosened the purse strings for the C.N.R. in the era of the 'Twenties, and a different Administration subsequently tightened them. It is absurd to assume that the management of an enterprise, whether public or private, could ignore entirely the attitude of those who supply the money it needs. When the supplies of such funds have as a motive some objective *other than the safety and the earning power of the investment*, then ipso facto some motive other than an economic one will inevitably be reflected, however unconsciously, in the policies of the management. Sir Henry himself was well aware of the existence of this more or less intangible influence, for in his testimony before the Duff commission in 1931 he said: "One of the inherent disadvantages of any state-owned enterprise such as the Canadian National Railways is the problem of political interference—and one might also add, public pressure. In making this statement I wish it distinctly understood that I imply no criticism of any party or government, present or past. I simply state a fundamental and universally admitted condition."

This statement by Sir Henry, and the obvious fact that the Canadian National Railways spent money on a large scale during the 'Twenties and was subsequently forced to go to bitter lengths with retrenchments, warrant the conclusion that the Canadian National Railways was exposed to the impact of political forces from which most private enterprises would have been free. As the author phrases it: "In the period of prosperity expenditures were popular and the people clamored for them; in the period of depression, economies were popular and the people clamored for them. Each government played for popularity, the Liberals by acquiescing in expansion and presenting the Canadian National to the people of Canada as an achievement of great worth, the Conservatives by relentlessly forcing curtailments and presenting the Canadian National to the people as a miserable disaster."

Career of Sir Henry Thornton

If the true function of a railway is to give efficient service at the lowest possible cost consistent with sound investment policy, the record as set forth in this book holds out no hope that the ideal is likely to be attained under government ownership. And be it remembered that the Canadian National Railways are not organized with a politician as their head as was the case during the regime of the Railroad Administration in this country. Instead their organization resembles that of a private corporation.

The book, aside from its practical importance as testimony of the inevitable, and even tragic, consequences when the impact of political forces is allowed—under government ownership—to fall on a great economic undertaking, is a profoundly moving human document. Sir Henry's career was a genuine tragedy. He was a great man, with a personality as engaging

as it was forceful. Whatever his mistakes, his ability as a railway executive was beyond question. He had proved it on railways in the United States before making his sensational success as general manager of the Great Eastern of England. It was owing to his work in England that he was placed in charge of transportation for the British Expeditionary Forces in Europe during the Great War. The reputation thus attained caused him to be made head of the Canadian National Railways. To have held important railway positions in three different countries stands as an achievement unparalleled in railway history. His welding of three railway organizations in Canada into dynamic unity almost overnight can never be forgotten by anyone who realizes, as he did, that the greatest of all railway problems is the human problem. If, as his critics charged, he failed, his previous record indicates that it was owing to conditions under which hardly any other man could have succeeded. The author is fully appreciative of the courage and imagination of his subject and deals with his career with insight and sympathy.

On the whole, the point of view of the book is definitely favorable to government ownership (on grounds which are social rather than economic and which would not apply to the United States) and to Sir Henry's regime. At the same time, the author concedes weaknesses in the position of his protagonist, and recognizes the difficult situation in which the privately-owned Canadian Pacific, and in particular its chief executive, Sir Edward Beatty, was placed by C.N.R. competition. His point of view has prevented him from dealing quite as generously with the champions of private ownership as he has with those who favor continuance of government ownership.

It is certainly important to note that the champions of government ownership in Canada—whatever the validity of their point of view—do not base their position on economic arguments. In the main they cite the desirability of maintaining competition, and excuse the financial losses of the government system on grounds of the desirability of providing transportation facilities for settlers in advance of the development of traffic to a remunerative level. Neither of these arguments could be used to defend government ownership in the United States.

Canadian Experience No Argument for Government Ownership

In Canada government ownership has attained as attractive a form as it could possibly be expected to display in a democracy. Under the leadership of a genius in dealing with men the C.N.R. developed a personnel of remarkable efficiency when gaged by any standard which has carried on remarkably well under the adverse conditions of depression. And yet the cost in dollars has been tremendous, while political influences caused the removal of the very man who developed into a united body the C.N.R.'s strongest

asset—its personnel. Failing the social reasons for government ownership which Canada may have, there is certainly nothing in the record from an economic standpoint to afford an argument for government ownership in the United States.

Improved Prospects of Railway Buying

The effect of the recent increases in railway net operating income in stimulating business and employment in the manufacturing industry will be hardly second in importance to their effect in improving the railway financial situation. Net operating income in October was \$75,425,092—the largest in any month of any year since October, 1930, when it was \$112,000,000. In July—when it was the smallest for that month of any year since 1932—it was less than \$27,000,000; in August, \$42,000,000; in September, \$57,359,000. The increase in October over July was 243 per cent. The increase in October, 1935, over October, 1934, was 55 per cent. Over October, 1933, it was 31 per cent and over October, 1932, it was 18 per cent.

This is the first year since 1932 when the trend of net operating income was upward during the fall months. The increase which began in the late summer of 1932 continued throughout the rest of the year, resulting in the amount earned in the last one-third of 1932 being larger than the amount earned in the first two-thirds. The improvement in general business then, and consequently in railway financial results, was halted by the banking crisis in the first third of 1933. Net operating income is not increasing relatively as rapidly now as during the last one-third of 1932; but it promises to be almost as large in the last four months of 1935 as it was in the first seven months of this year, and larger than in the last one-third of any year since 1930; and there is no prospect that its increase will be

arrested at the beginning of 1936, as it was in 1933.

The reason why the recent rapid increase in net operating income is so important to the manufacturing industry is that, as repeatedly has been statistically demonstrated by the *Railway Age*, the amount of railway buying done from manufacturers is determined, not only for long periods, but year by year, and almost month by month, by the amount of net operating income earned. Eminent economists have said that, under present conditions, the three requisites to a restoration of prosperity and employment are a revival of foreign trade, a revival of building construction and a revival of railroad buying.

A revival of residential construction has been under way and accelerating throughout 1935. Railroad buying from the manufacturing industry declined from an annual average of about \$1,400,000,000 in the five years 1925-1929, inclusive, to an average of about \$320,000,000 in 1932 and 1933. Under the stimulus of government loans and an increase in net operating income in the early part of 1934, it increased to about \$483,000,000 in the first 11 months of 1934. Following a subsequent decline of net operating income, railway buying from manufacturers declined to about \$368,000,000 in the first 11 months of 1935. In the first 11 months of 1934, expenditures for new equipment were about \$92,000,000, and in the first 11 months of 1935, about \$31,000,000. The comparable expenditures for other materials and supplies in 1934 were about \$391,000,000; in 1935, about \$337,000,000.

The increase in net operating income occurring is certain to change, and, in fact, already is changing, this recent trend of railroad buying from downward to upward. The increase in buying will be about proportionate to the increase in net operating income, which in September and October, 1935, was about 50 per cent greater than in September and October, 1934. If business continues to improve, the increase in net operating income will continue at an accelerating rate, and the railroads will give the manufacturers more business in 1936 than in any year since 1930.

Transportation Problem Ethical as Well as Economical

We hear a good deal of the shocking greed of "big business." The Mississippi Valley Association consists of mid-continent agricultural, shipping and industrial interests of no less than 25 states. It does not seem to have many "bankers" in its membership; at least, it is quite certainly not redolent of anything that could be called a Wall Street odor. Its roots, indeed, are more in the "common people" than in any other soil. Yet its members demand that millions of the public's money shall be spent on top of hundreds of millions already spent to provide an avenue of transportation for their use

free of charge, and that in using it they shall be free to compete with citizens using their own money, while the latter are to be restrained from competing with them!

Where, in the annals of "big business," can be found anything even approaching this attitude for pure, porcine, impudent greed, and apparently complete insensibility to elementary principles of fairness? The remarkable thing about it, perhaps, the worst significance implicit in it is that, despite the fact that year after year this aggregation of citizens has reiterated the same demand, the rest of the citizens—or a large

part of them—display no surprise, no disapproval, no concern even over this unblushing demand for public money to be used for private benefit. What can this signify other than a serious and widespread obliquity of ethical vision on the part of a large proportion of the public? . . .

The nationwide war on the public utility corporations speaks for itself as yet another expression of the same thing. As in the case of the waterways and the railroads it seems to disclose some great "fault" in the bed-rock structure of our national ethics. It is not a pleasant thought—but how escape it?

—Thomas P. Woodlock in the *Wall Street Journal*.

Large Reinforced Concrete Piles Prove More Economical

Missouri Pacific has applied 5,000 of them after demonstrating special advantages of the three-pile bent



Above—Three 24-in. Piles Set and Driven Without Disturbing the Stringers

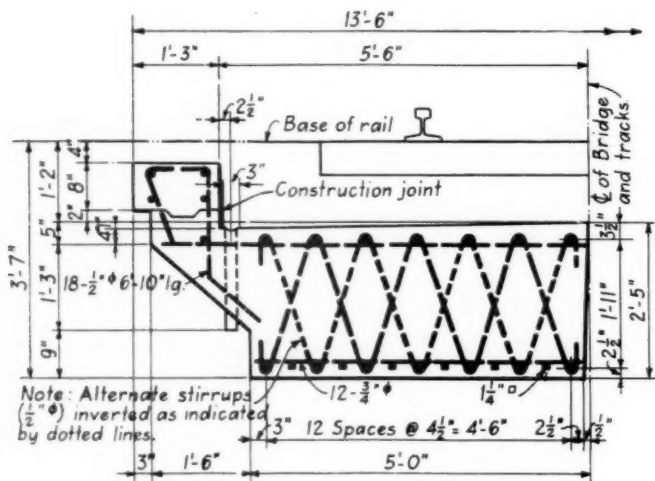


Accurate Setting of the Piles Is Assured By Digging Holes at the Site of Each Bent and Constructing Heavy Timber Frames

THE experience of the Missouri Pacific in the construction of trestle structures involving the use of reinforced concrete piles 24 in. in diameter has demonstrated economies for concrete in this particular application greatly exceeding those attainable with earlier designs. Concrete pile trestles built heretofore have constituted imitations of the wooden pile trestle, involving

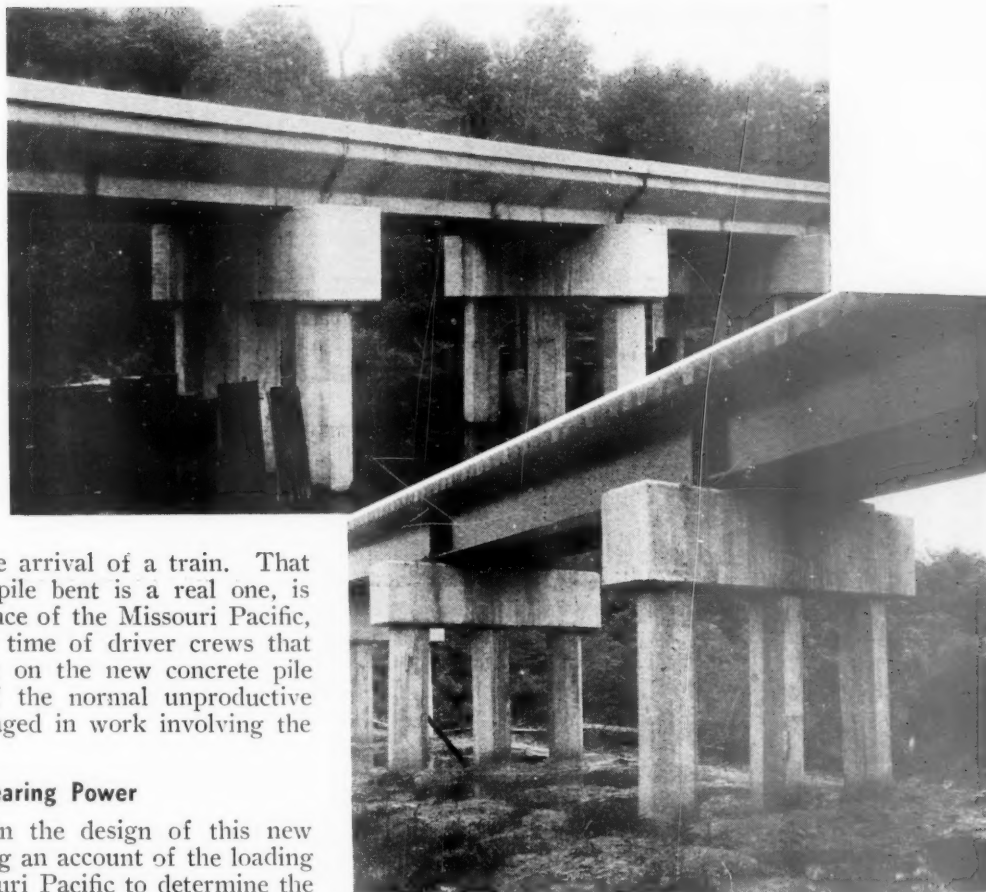
the use of piles not more than about 16 in. in diameter. While the use of larger piles has made it possible to reduce the number per bent and has thus effected a corresponding economy in the number of piles to be driven, the outstanding advantage realized from the use of larger piles arises from the development of the three-pile bent, which possesses an advantage over bents containing any greater number of piles that is not measured by the mere reduction in number.

The vast majority of railway bridges built today are constructed to replace older bridges. Therefore, the construction of a pile trestle almost invariably involves the driving of the piles through the deck of the old bridge, and in the driving of four, five or six-pile bents, at least two of the piles of each bent cannot be driven without shifting the stringer chords. As a result, except on lines of exceedingly light traffic, a large part of the time of the driving crew is occupied in shifting the deck—either to open it to permit driving, or to close it to enable trains to pass. The three-pile bent eliminates this difficulty, since with only three piles it is possible to space them in the bent so as to clear the chords entirely. The only preparatory work necessary, so far as the bridge deck is concerned, is to shift three ties, and since these ties can be quickly replaced, the principal precaution imposed on the pile-driver crews in avoiding interference with trains is to make sure that the driving of no pile is started without ample time to



Cross Section of An 18-ft. Slab

The Piles Are Used Primarily for Reinforced Concrete Slab and Steel-Beam Spans



complete it in advance of the arrival of a train. That this advantage of the three-pile bent is a real one, is clearly shown by the experience of the Missouri Pacific, where the proportion of the time of driver crews that is lost in clearing for traffic on the new concrete pile trestles is but a fraction of the normal unproductive time of a driving outfit engaged in work involving the shifting of stringer chords.

Investigate Bearing Power

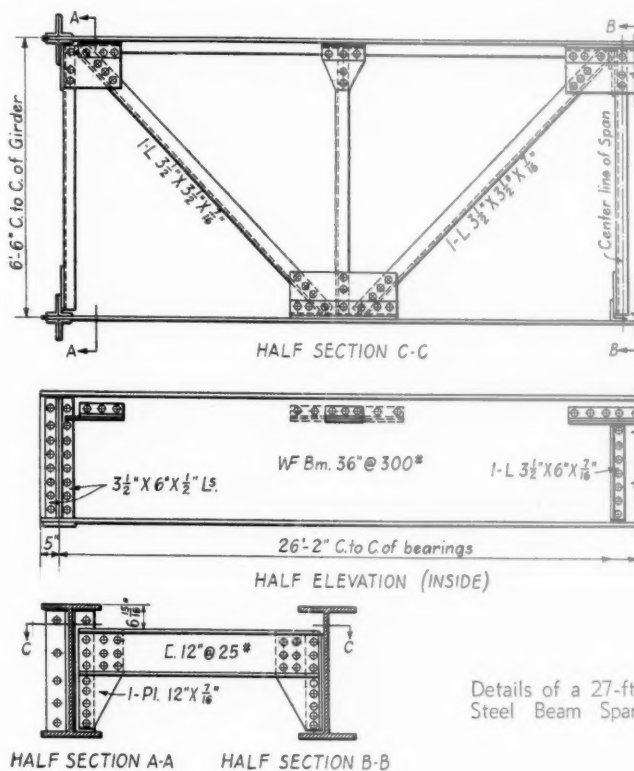
The problems presented in the design of this new type of construction, including an account of the loading tests conducted by the Missouri Pacific to determine the relative load-carrying capacity of the 24-in. piles, compared with piles of ordinary dimensions, were reviewed in an article in the *Railway Age* of February 10, 1934, page 220, which was written by F. E. Bates, bridge engineer of the Missouri Pacific, under whose direction this development was carried out. But like all other innovations, many practical problems of construction had to be solved before it was possible to develop the requisite technic for the effective and economical manufacture, shipment and driving of the piles. However, experience in the use of some 5,000 of these piles in new bridges on the Missouri Pacific during the last three years has afforded ample opportunity for the perfection of construction methods and for a demonstration of the inherent economies of this new type of construction.

These large reinforced concrete piles have been used primarily in two types of structures, namely, all-concrete structures in which the bents serve as the supports for reinforced concrete slabs that carry ballasted track, and steel-beam spans that are generally provided with an open deck, although some of them have been built with a creosoted-timber ballast deck. In addition, these piles have been employed in groups of six or more to serve as piers for plate girder spans. The panel lengths for concrete slab structures range from 15 to 18 ft., while the steel spans, because of their smaller dead load, are appreciably longer—usually either 24 or 27 ft. An important factor in the determination of the exact span lengths adopted is a bent spacing that will avoid interference with the bents of the old structure that is to be replaced.

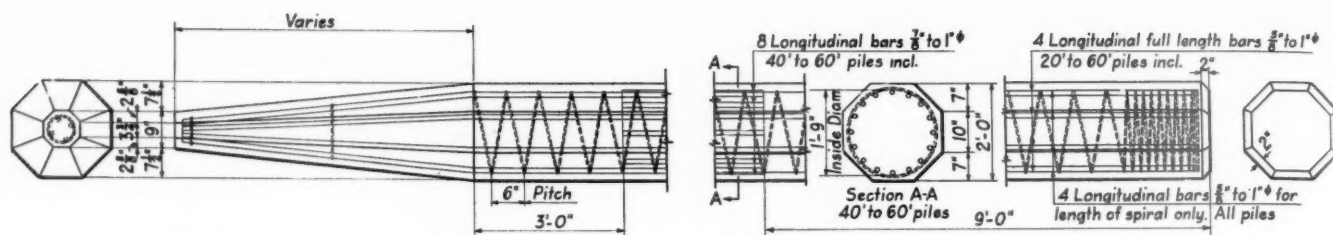
The 24-In. Pile

The concrete pile developed by the Missouri Pacific has an octagonal section, 24 in. on the short diameter, and is tapered at one end for a length of 3 to 6 ft. to form a 9-in. octagonal tip. The reinforcement consists of longitudinal deformed rods from $\frac{5}{8}$ -in. to 1 in. in

diameter, with spiral wrapping of No. 4 gage wire on a 6-in. pitch, except for 7 turns on a 2-in. pitch at the butt to resist the bursting stresses of driving. As in concrete piles of smaller diameter, beam strength to resist the stresses set up in handling, rather than the strength as a column, is the controlling factor in design. The strength in bending is about $2\frac{1}{4}$ times and



Details of a 27-ft. Steel Beam Span



Details of the Reinforced Concrete 24-in. Pile

the stiffness is 5 times that of a 16-in. pile. The maximum length of the piles driven to date is 60 ft., but splicing has been resorted to in numerous instances, as will be explained later.

The maximum height of the structures in which these concrete piles have been used is 30 ft., measured from base of rail to ground line. When this height exceeds 18 ft., double or anchor bents, described below, are introduced at intervals of about 150 ft. in long structures, and additional stiffness is provided by encasing the piles of each plant at the ground line in a concrete collar or sash brace 3 ft. wide and deep, and 13½ ft. long.

The piles of each bent are surmounted by a cap 3 ft. wide, 3½ ft. deep and 13½ ft. long for the single intermediate bents, and 6 ft. wide for the double or anchor bents provided at intervals in long, high structures. These larger caps cover the tops of two rows of piles 3 ft. center to center. The end bents are like the single intermediate bents, with the addition of back walls and short cantilevered wings, except when placed in new embankment, in which case a double row of piles, three in front and two in the rear, is used.

The Slab Structure

The superstructure for the reinforced concrete trestles consists of split slabs, i.e., two slabs per track, with a

longitudinal joint along the center line of the tracks as well as between tracks. Slabs for single-track or for the outside rows on multiple-track bridges are only 5 ft. wide at the bottom, but have copings that project outward to a distance of 6 ft. 9 in. from the center line of the track, as well as 11 in. above the ballast-supporting surface. This arrangement results in a saving of 2.7 cu. ft. of concrete per lineal foot of slab, compared with a slab having a bottom width of 6 ft. 9 in. In an 18-ft. slab, this amounts to a reduction of 1.8 cu. yd. of concrete, and 3.6 tons in the weight. The 18-ft. slabs, the ordinary maximum length, have a depth of 2 ft. 5 in., so that with a vertical distance of 1 ft. 2 in. from base of rail to top of slab, these spans involve a total floor depth of 3 ft. 7 in. The 18-ft. slabs weigh 18½ tons.

The ballast-supporting surface is not provided with a complete waterproofing system, the treatment of the surface as a whole being confined to a coat of emulsified asphalt applied at the concrete plant, where the resulting sealing off of evaporation permits a reduction in the curing period. The tops of the slabs are also sloped laterally one inch from the edge under the center line of track for drainage, parapet slabs being provided with drain pipes at the low point.

To prevent leakage of water or ballast through the joints between slabs, both longitudinal and transverse, the tops of the slabs are recessed at these joints to form a depression one inch deep and about eight inches wide, into which a two-ply membrane waterproofing is applied with a protection consisting of an asphalt plank one inch thick. In addition, the space between the ends of slabs over the bents is filled with elastite.

The Beam Spans

The beam spans are constructed of wide-flange (CB-section) beams, two for each track, spaced 6 ft. between centers for open decks, and 6½ ft. between centers for timber ballast decks. The beam sizes range from 36-in. 230-lb. for 24-ft. open-deck spans, to 36-in. 300-lb. for 27-ft. ballasted spans. The bracing system, which has been designed to secure maximum simplicity of fabrication and avoid any holes in the beam flanges, as seen in the drawing, embodies three cross frames, one at each end and one at mid-span, and lateral bracing in one plane about 7 in. below the top flanges. The sole plates, ¾ in. thick, are attached to the bottom flanges of the beams by ½-in. fillet welds.

For protection against brine drippings, the top flanges of the beams are covered in the field with wrought iron plates 20 in. wide by ¾ in. thick, this width being sufficient to provide an overhang of 1½ in. beyond the edges of the beams. These projecting edges are bent down on curves of 2-in. radius to form drip edges.

The slabs and piles are manufactured in a concreting plant at Little Rock, Ark., and have been shipped to Missouri Pacific points as far as 800 miles from the plant. However, the out-of-pocket cost of the transportation is by no means proportional to the distance, where the movement is in the direction of light traffic.



Setting the Slabs Is a Simple Operation

The mix, for the aggregates used at Little Rock, is 1-2.4-3.6, and the strength of the concrete at 28 days ranges from 3,500 lb. to as much as 4,200 lb. per sq. in.

Bearing Power

Because the development of adequate bearing power is the critical element in the success of this type of structure, the driving of the piles has been a subject of intensive study, and in actual practice is conducted under the direction of experienced foremen who give it their personal attention, such other operations as are in progress simultaneously being supervised by the assistant foreman.

Analytical studies of the potential bearing power of the 24-in. piles were confirmed by a series of loading tests, as reported in the article by Mr. Bates previously referred to, the general conclusion being that under the same conditions the 24-in. pile has a bearing power roughly double that of a 16-in. pile. Loading tests are readily made during the driving of any trestle by blocking up the bridge deck on the middle pile of a bent and spotting the front truck of the pile driver crane over this pile. The load line of the crane is then made fast to a driven pile in a bent in front of the pile that is being tested, and when a strain is taken on the line, substantially the entire weight of the crane is concentrated on the test pile. The design load on the piles in the three-pile trestle bents is about 60 tons per pile, live load plus dead load; impact is not considered.

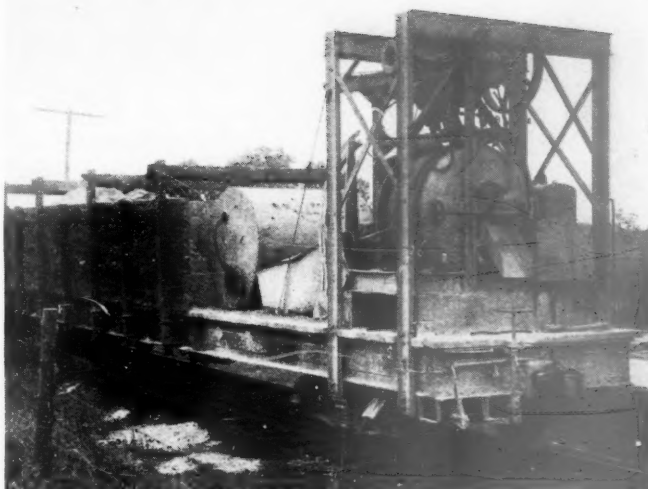
To develop the capacity of these larger piles requires a more powerful hammer, and after investigation the Vulcan No. 0 steam hammer with a 7,500-lb. ram was adopted for this work. For piles 40 ft. or more in length sufficient additional weight is applied to the ram to give a total weight of 9,000 lb. As the piles weigh about 500 lb. per foot of length and piles up to 60 ft. in length are driven, an essential requirement of the driving equipment is the safe and expeditious handling of loads of 15 tons, exclusive of the weight of the hammer and leads. Accordingly, the use of leads was dispensed with and the piles and hammer are handled by a locomotive crane. The Missouri Pacific uses two locomotive cranes in this service—one of 50 tons and the other of 30 tons capacity, both capable of traveling at 20 miles per hour.

To insure accurate placing of the piles, a hole from four to six feet deep is bored for each pile with an earth auger and a heavy timber guide frame is set over these holes and securely braced against the adjacent old bents. By this means and the exercise of care in plumbing the piles before the driving is started and in keeping the hammer in a vertical position, it has been possible to drive the piles with a high degree of accuracy. This preparatory work may be started some time in advance of the arrival of the driving outfit.

The top of the pile is cushioned during driving by a block of gum or oak, four to six inches thick that is inserted in the bonnet of the hammer. One block will drive from two to four piles, depending on driving conditions. A noticeable difference in penetration per blow is experienced with a fresh block and one that has been used to drive one or more piles, owing to the additional cushioning effect of the wood before it has been compressed. With this protection, shattering of the tops of the piles has been avoided.

Spliced or Cut to Length

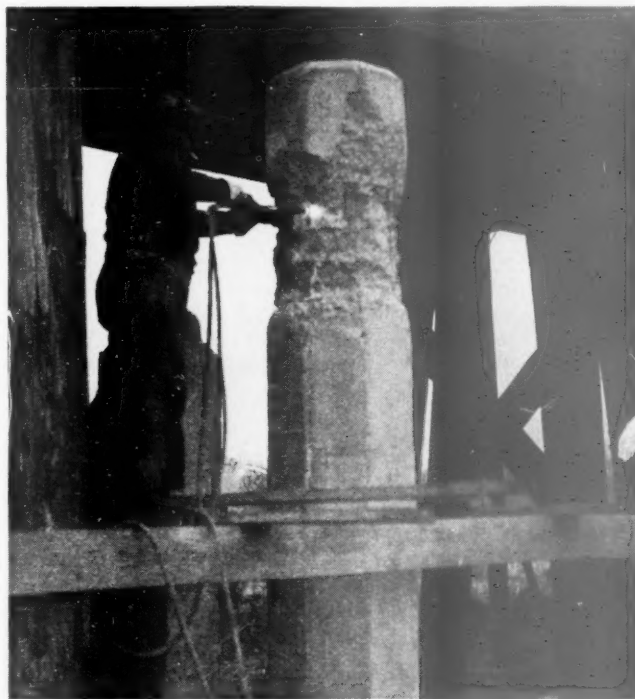
The pile lengths are determined by driving timber test piles with a No. 2 Vulcan hammer and no difficulty is experienced in securing equal or greater penetration with the concrete piles. However, no complications are



The Car-Mounted Plant Used for Concreting the Caps

introduced in the event that it is found necessary to drive the piles to a greater depth or to discontinue driving at a less depth than that assumed in determining the length required. A pile can be readily cut off in 20 min. by notching the concrete with a jack hammer or hand tools to expose the bars, and then burning these off with a gas torch. As a matter of fact, it is the regular practice to leave the two outside piles of each bent 18 in. high and then cut away the concrete for that distance so that the exposed reinforcement will serve as an effective bond between the piles and the cap. A similar procedure in the case of piles that have to be over-driven affords the necessary bond for a splice between the pile and an extension concreted on top of it in the field. Such splices have been made in such a workmanlike manner that the joint is scarcely discernible.

Owing to the reduction in time lost on account of interruptions to the work to permit trains to pass, the output of the driver in the driving operation is appre-



Cutting Off a Pile—The Concrete Is Cut Away So that the Bars May Be Burned Off with a Torch

ciably greater than is the case with six-pile bents. Typical of the performance is the driving of a maximum of eighteen 35-ft. piles per 8-hr. day to a penetration averaging 25 ft. through clay, sand and silt, with four interruptions for train movements. Where the interval between trains permits, as many as 9 piles have been set in place and then driven in a substantially continuous operation.

Concreting the Caps

The caps are concreted in sectional forms assembled around the tops of the piles and supported by means of heavy steel clamps that are bolted around the piles beneath the bottom form. The concreting is done with a mixing plant mounted on a flat car, and embracing a gas-driven Koehring 10-cu. ft. mixer placed at one end of the car so that it can be discharged directly into the forms, a water tank, and a bin for 20 cu. yd. of fine and coarse aggregates, together with storage space for enough cement to concrete four caps. The operation of this plant requires five men—a mixer operator, two men charging the mixer and two men in the form. On small jobs or on the last few bents of a long bridge, high-early-strength cement is sometimes used to avoid delay in the setting of the superstructure, which is done by the same force that has been employed in building the bents.

Setting the superstructure is a simple operation, whether it involves the placing of concrete slabs or steel beam spans. The progress made depends on the traffic interference, but as many as ten panels of slabs have been set in one day, while on a trestle crossing of an overflow opening of the St. Francis river east of Poplar Bluff, Mo., ten 27-ft. beam spans were erected in one day. The operation is expedited by providing a light crane to remove the old timber deck, thereby permitting the crew of the large crane to devote its time exclusively to the handling of the new superstructure. The slabs are set on a bed of dry portland cement.

A typical gang for the construction of these pile trestles, including the pile driving, the concreting of the caps and the setting of the superstructure, is made up as follows:

- 1 foreman
- 1 assistant foreman
- 1 crane operator
- 1 crane foreman
- 4 carpenters—first class
- 2 carpenters—second class
- 2 to 4 carpenter helpers
- 2 to 6 laborers (largely local)

While the three-pile trestle construction has been applied to many bridge openings requiring but a few spans, it has been adapted also to bridges of considerable length. For example, the St. Francis overflow crossing is an open-deck steel beam-span trestle, 2,600 ft. long, while the bridge over the Black river near Corning, Ark., contains 101 panels of reinforced concrete slab spans occupying 1,800 lineal feet of bridge.

THE BRITISH GOVERNMENT has recently agreed to guarantee a further loan of £30,000,000 to be negotiated by the railroads to finance a rehabilitation and improvement program. This will be the second railway loan guaranteed by the British government this year. The first, for £35,000,000, was negotiated last July and the proceeds used to the extension of electrification work in the London suburban area. Proceeds of the new loan will be used for a variety of improvements on all four British roads, including construction of new branch lines and equipment, extension of electrification, enlargement of station and yard facilities, signaling equipment and double tracking.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended November 30 totaled 570,427 cars. Because of the Thanksgiving Day holiday this was a decrease of 76,076 cars as compared with the week before but it was an increase of 82,242 cars, or 16.8 per cent, as compared with the corresponding week of last year and of 70,831 cars, or 14.2 per cent, as compared with 1933. For the second time this year the figures exceeded those for the corresponding week of 1931 by more than 10,000 cars. All commodity classifications except live stock showed increases as compared with last year, as did all districts. The summary, as compiled by the Car Service Division of the Association of American Railroads, follows:

Revenue Freight Car Loading

For Week Ended November 30, 1935

Districts	1935	1934	1933
Eastern	127,791	105,299	110,932
Allegheny	112,147	93,147	95,794
Poahontas	39,932	33,164	31,668
Southern	84,007	75,804	74,763
Northwestern	66,953	57,838	56,547
Central Western	87,931	76,521	83,999
Southwestern	51,666	46,412	45,893
Total Western Districts.....	206,550	180,771	186,439
Total All Roads.....	570,427	488,185	499,596
Commodities			
Grain and Grain Products.....	30,162	23,781	26,474
Live Stock	13,026	15,873	14,392
Coal	120,276	103,597	104,461
Coke	7,777	4,467	5,834
Forest Products	25,954	18,668	20,977
Ore	7,108	3,579	2,839
Merchandise L.C.L.	137,846	136,769	141,579
Miscellaneous	228,278	181,451	183,040
November 30	570,427	488,185	499,596
November 23	646,503	561,942	585,738
November 16	628,330	585,034	602,708
November 9	653,525	594,790	583,073
November 2	680,662	613,048	614,136
Cumulative Total, 48 Weeks....	29,199,789	28,740,391	27,132,412

The freight car surplus for the first half of November totaled 232,688 cars, an increase of 24,530 cars as compared with the last half of October. The total included 133,918 box cars, 61,045 coal cars, 21,663 stock cars, and 6,371 refrigerator cars.

Car Loading in Canada

Car loadings in Canada for the week ended November 30 totaled 46,815, as against 45,515 for the corresponding week last year and 48,983 for the previous week, according to the compilation of the Dominion Bureau of Statistics.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada:		
November 30, 1935.....	46,815	21,479
November 23, 1935.....	48,983	22,593
November 16, 1935.....	48,684	21,519
December 1, 1934.....	45,515	17,575
Cumulative Totals for Canada:		
November 30, 1935.....	2,191,645	1,024,092
December 1, 1934.....	2,162,817	1,022,310
December 2, 1933.....	1,888,498	885,088

THE NORTHERN PACIFIC AND THE GREAT NORTHERN have offered to furnish coaches to be used as classrooms for Helena, Mont., high school students who were driven from their own buildings by recent earthquakes. Railroad power plants will provide light and heat for the coaches.

Co-ordinator Reports on Comparative Costs of Steam Locomotive Repairs

Analysis of data submitted by 15 selected roads permits interesting comparisons and indicates need of greater uniformity in statistics

UNDER date of November 27, 1935, Co-ordinator Eastman submitted to President Pelley of the Association of American Railroads a report on the comparative costs of steam locomotive repairs which was prepared by the Section of Car Pooling, under the direction of N. D. Ballantine in an effort to answer a question as to why wide variations exist in the cost of steam locomotive repairs between different districts. This question was raised by the co-ordinator after the report on Steam Locomotive Repair Costs for the years 1927, 1928 and 1929, which was released June 9, 1934, showed that as compared with the western group, the eastern group costs were higher by 40.2 per cent per locomotive-mile, and by 39.8 per cent per potential horse-power-mile.

In making the present study five roads were selected from each of the three groups and, the report states, the combined data for the 15 roads compare well in a great many respects with the data for all Class I roads, and likewise the five roads totals agree closely with many of their respective group totals, indicating that the selection was typical. The roads selected were:

EASTERN GROUP

Boston and Maine
Chesapeake & Ohio
Including Hocking Valley
The Delaware and Hudson
Delaware, Lackawanna & Western
Eric
Including Chicago & Erie

SOUTHERN GROUP

Florida East Coast
Illinois Central
Including Yazoo & Mississippi Valley
Richmond, Fredericksburg and Potomac
Seaboard Air Line
Southern Railway

WESTERN GROUP

Atchison, Topeka & Santa Fe
Including Panhandle & Santa Fe
Chicago & Northwestern
Chicago, Burlington & Quincy
Southern Pacific (Pacific Lines)
Union Pacific

The 15 selected roads aggregate 29.1 per cent of total miles of track operated by Class I railways; compared with their respective group totals, they operated 15.7 per cent of the eastern, 48.9 per cent of the southern, and 31.6 per cent of the western. There was very little difference between the proportion of locomotives owned and the track miles operated. The average tractive force owned by the selected roads was exactly the same as for Class I railways, namely, 43,800 lb. for all classes of power; 226 locomotives, approximately 2 per cent of their road power, were used for both freight or passenger service. The average tractive force for all roads in the southern group was 40,500 lb., the lowest; western, 41,800 lb., and for the eastern, 46,700 lb., or 15.3 per cent more than the southern group.

In submitting the report to Co-ordinator Eastman, Mr. Ballantine summarized certain portions of the report as follows:

The calculations include about 40,000 locomotives representing 116,079 locomotive-years; more than 3,200 million locomotive-

miles, and nearly 619 million horsepower units. The repair costs amounted to more than 709 million dollars.

It is fully realized that there are many factors which, if available, would appreciably add to the refinement with which comparisons of repair costs could be made.

The "economic life" to which we here refer has to do with determining, as nearly as may be practical from available data, when the mounting cost of locomotive repairs, as affected by the combination of *age and use*, exceeds what the records show to be the point where continued use becomes an unwarranted drain upon operating expenses. There are many other and important factors which need careful consideration.

As the size and investment in locomotives increase, the importance of intensive utilization becomes paramount. The study shows that the more quickly the economic life is run out, through obtaining say 90,000 to 100,000 or more miles per locomotive per year, the greater the net return upon the investment. It also clearly shows that the continued use of locomotives beyond their economic life is a heavy and unwarranted drain upon operating expenses.

The study was based on the period 1927-1929, and it is not now possible to get certain facts because there were no currently maintained records. Among the factors which have an important bearing on the question which we are now endeavoring to answer, and which cannot now be fully developed and analyzed, are these:

- 1—Shop management.
- 2—Influence of financial status as reflected in the policy of taking a stitch in time, or otherwise.
- 3—Adequacy of shop and roundhouse facilities.
- 4—Shop practices; limits of wear and tolerance of fit to moving parts.
- 5—Water supply, and the economics of its treatment, as reflected in the cost of locomotive repairs.
- 6—Design of locomotive and tender.
- 7—Relation of fuel to water supply carried on tender as it may affect the frequency of stops.
- 8—Influence of speed upon repair costs, as applied to locomotives with drivers so small as to limit the ability to properly counterbalance and minimize the dynamic augment.
- 9—Development of free running time of trains between terminals, and the influence of "deceleration and acceleration" as affected by the number and location of stops at intermediate points.
- 10—Cost of maintaining locomotive cab signals and train-control service.
- 11—Costs of maintaining special devices; determination of extent to which they are used in practice, and the net benefits accruing.
- 12—Locomotive operating methods with respect to the use of "throttle," "cut-off," as well as "control" on long descending grades at various speeds.
- 13—Fuel-handling methods, distribution and accounting.
- 14—Proportion of total locomotive fuel consumed in terminals and roundhouses.
- 15—Influence upon cost of boiler repairs or boiler washout plants.

Not only was it impossible to develop and analyze the above factors in any adequate way, but as the study progressed it became evident that numerous statistical measures could not be used in the customary manner for making comparison or drawing conclusions. These circumstances preclude a decisive and complete answer to your question. Even in the case of the two principal items, "wages" and "load factor," which are most susceptible of comparisons, it has become necessary to resort to certain assumptions.

However, it is believed reasonable to justify an excess in the unit cost of locomotive repairs in the eastern over the western group to the extent of 7.9 per cent by a higher hourly wage rate, and to the extent of 13.5 per cent by the greater load factor of the eastern locomotives.

Deferred maintenance to locomotives in active service and a shorter run between roundhouseings will probably account for a substantial portion of the remaining difference of 18.6 per cent.

Summary of the Study

The report contained a brief outline of the study which was made of the data submitted by the 15 selected roads

in reply to the Co-ordinator's Questionnaire C.P.-3. The following paragraphs are selected from that outline and represent cases where the significant data from the tables in the report are summarized.

The Formula for Computing Freight-Car Resistance indicates that on a level tangent track at 10 m.p.h. the resistance per ton for a car having a gross weight of 85 tons is 3.1 lb., while for an empty car weighing 20 tons it is 7.6 lb., or nearly two and one-half times as much.

The Tare or Light Weight of Freight Cars for Class I railways was 21.8 tons; for the 15 selected roads it was 22.54; by roads it varied from 20 tons on the C. B. & Q. to 24.69 tons on the A. T. & S. F., a difference of 23.5 per cent.

The Net Tons, Revenue and Non-Revenue Freight, per Loaded Car-Mile for Class I railways was 26.82; for the 15 roads, 25.53. In the eastern group, the C. & O. was 118.3 per cent more than the B. & M.; in the southern group, the Illinois Central was 49.5 per cent more than the R. F. & P., and in the western group, the C. B. & Q. was 28.3 per cent higher than the Union Pacific. By roads, the extremes were: R. F. & P., 18.44 tons, and the C. & O., 43.58, a difference of 136.3 per cent.

The Gross Tons per Loaded Car-Mile for Class I railways was 48.62; for the 15 roads, 48.07. By groups, in the eastern group, the C. & O. was 61.1 per cent more than the B. & M.; in the southern group, the Illinois Central was 23.1 per cent more than the R. F. & P.; in the western group, the C. B. & Q. was 5 per cent above the Union Pacific. The extreme difference was the C. & O., 62.4 per cent above the R. F. & P.

The Ratio of Empty to Loaded Car-Miles in Direction of Traffic for Class I railways was 32.9; for the 15 roads, 28.2. By groups, in the eastern group, the C. & O. was 135.8 per cent above the D. & H.; in the southern group, the F. E. C. was 93.5 per cent above the R. F. & P.; in the western group, the C. & N. W. was 171.2 per cent above the Union Pacific. By roads, the extremes were the C. & O., 211.2 per cent above the Union Pacific.

The Average Weight of Loaded and Empty Cars in Direction of Traffic for Class I railways was 42 tons; for the 15 roads it was 42.5 tons. In the eastern group, the C. & O. was 43.8 per cent higher than the B. & M.; in the southern group, the Illinois Central was 15.4 per cent above the S. A. L.; in the western group, the A. T. & S. F. was 9 per cent more than the Union Pacific. By roads, the extremes were C. & O., 44.1 per cent higher than the S. A. L.; that is, 54.2 vs. 37.6 tons.

The Resistance "Per Ton" and "Per Car" in Direction of Traffic on level tangent track at 10 m.p.h. for Class I railways was, per ton, 4.53 lb.; for the 15 roads, 4.5 lb. By groups, for the eastern group, B. & M., 25.3 per cent more than the C. & O.; for the southern group, S. A. L. was 9.5 per cent more than the Illinois Central; for the western group, Union Pacific, 5.9 per cent more than the A. T. & S. F. By roads, the extremes were the B. & M. and S. A. L., 25.3 per cent higher than the C. & O. This means that, under the conditions cited, to produce ton-miles the B. & M. and S. A. L. must either have power relatively 25.3 per cent greater or work their power that much harder than the C. & O. If their power is worked harder, it justifies an increased cost for locomotive repairs per potential horsepower unit.

The Pounds of Net Lading per Pound of Drawbar-Pull in Direction of Traffic on level tangent track at 10 m.p.h. for Class I railways was 212.1; for the 15 roads, 208.2. By groups, for the eastern group, the C. & O. handled 66.2 per cent more than the B. & M.; for the southern group, the Illinois Central handled 30.3 per cent more than the F. E. C.; for the western group, the C. B. & Q. handled 21.6 per cent more than the A. T. & S. F. By roads, the extremes were the C. & O., which handled 82.1 per cent more than the F. E. C.; that is, 298.4 lb. vs. 163.9.

The Influence of Boiler Capacity upon Speed is clearly illustrated by comparing two locomotives having approximately the same tractive force. One of them is provided with a boiler capacity of 2,232 hp. and the other has 4,191 hp., or an increase of 87.9 per cent. On a 0.3 per cent grade, using 70-ton loaded cars, the larger locomotive will handle only 9 per cent more tonnage at 10 m.p.h.; 57 per cent more at 20 m.p.h.; 92.9 per cent more at 30 m.p.h., and 123.6 per cent more at 40 m.p.h. Thus, it is evident that to get the benefit out of the added investment for boiler capacity the locomotive must be used at 30 m.p.h. or better.

The Potential Horsepower was determined by dividing the

"pounds of water evaporated per hour by direct and indirect heating surface" by the "steam factor," a formula agreed to by the three leading builders of locomotives.

The Steam Factor is a function of the working steam pressure and the degree of superheat; it is the pounds of steam required to produce an indicated horsepower-hour at a piston speed of 1,000 ft. per min. Roughly, it means that an antiquated locomotive using saturated steam at 150 lb. pressure will use approximately two thirds more fuel to produce a given amount of power than is required by a modern locomotive using 250 lb. pressure and 250 deg. of superheat. From this it follows that a knowledge of the weighted steam factor is essential if proper comparisons are to be made with respect to fuel economy. The weighted steam factors of owned and used locomotives have only been computed for the 15 selected roads. For the owned locomotives the extremes were: Union Pacific—lowest—20.89, and the D. & H.—highest—23.77, a difference of 13.8 per cent. For the used locomotives the extremes were: F. E. C., 19.91, and the D. & H., 22.18, a difference of 11.8 per cent.

While the steam factor of the locomotives owned by the Union Pacific was slightly lower than of those owned by the A. T. & S. F., by reason of a more intensive use of their newer locomotives the A. T. & S. F., steam factor used was slightly lower than that of the Union Pacific.

The Maintenance Standards, as reflected by the condition of locomotives inspected and reported upon by the Interstate Commerce Commission, Bureau of Locomotive Inspection, furnish an indication of the extent to which a "stitch in time" has, or has not, been taken. Deferred maintenance to active locomotives undoubtedly results in increased cost of repairs. Data cover only the 15 roads and show that, of the locomotives inspected, 20.7 per cent were found defective and 1.2 per cent were ordered out of service. The western group was lowest, with 17.8 per cent found defective, while the southern and eastern groups were 21.3 and 44.4 per cent higher, respectively. Of those ordered out of service, the western group was low—0.8 per cent, while the southern and eastern groups were 1 and 2.1 per cent, respectively.

Maintenance of Equipment Employees working on a Daily Basis in proportion to the total maintenance of equipment employees aggregated, for Class I railways, 3.42 per cent of the total hours. By groups, the southern was 2.98; the western, 3.44, and the eastern, 3.55. While the southern group had the smallest proportion of hours, they paid the highest rate per hour (computed on the basis of eight hours per day) or \$1.223; the eastern group was \$1.148, and the western group, \$1.079. By roads, the proportion of employees working on a daily basis ranged from 2.06 per cent on the Union Pacific to 7.35 per cent on the F. E. C. Of the total wages paid to them the range was from 3.98 per cent on the Southern Pacific to 14.05 per cent on the F. E. C. The rate per hour varied from \$0.947 for the Erie to \$1.30 for the Illinois Central.

Maintenance of Equipment Employees Working on an Hourly Basis.—Eleven groups were selected for analysis and comparison. They aggregated approximately one-half the total maintenance of equipment employees; hours of service, and total wages paid. No data are available to indicate what proportion of their time was devoted exclusively to locomotive repairs. However, it is believed they are sufficiently representative. Their average wage rate per hour for Class I railways was 66.3 cents. For the southern group it was 57.8 cents; the western, 63.6 cents, and the eastern group, 71.17 cents, or 11.9 per cent higher than the western group. Had the eastern group used the same proportion of the various groups of employees as did the western group, the difference in wage-rate per hour would have been only 6 per cent instead of 11.9 per cent.

There are no data available to indicate what proportion of the total cost of locomotive repairs, Account 308, was paid to labor during the period covered by the study. Recent inquiry indicates it would approximate 66 per cent. On that basis it would be fair to say that 7.9 per cent of the increased cost of locomotive repairs, eastern vs. western group, was due to the wage-level paid.

The Pounds of Coal per 1,000 Gross Ton-Miles by Interstate Commerce Commission districts and for Class I railways were tabulated for eight years, 1927-1935, for the months of January and July, as well as for the calendar years. It developed that the average of the January-July consumption agreed almost exactly with the annual figure, in this respect agreeing with the mean temperature variations and this regardless of the fact that there was a variation in the annual figures. The net increase in

pounds of coal used in January over July for the eight years for Class I railways was 25 lb.; for the Eastern District, 24 lb.; the Western District 28 lb., and the Southern District, 20 lb.

The Pounds of Coal per 1,000 Gross Ton-Miles per Degree Change in Temperature for the 15 roads was 0.62; for the eastern group, 0.43; western group, 0.57, and southern group, 0.73. Using one-half pound as a general average this would justify the C. & N. W. using 13.3 lb. more fuel per unit of service than the F. E. C., due to there being 26.6 deg. lower mean temperature. This is equivalent to saying that the C. & N. W. has to burn 11.1 per cent more fuel than would be necessary if they had the same mean temperature as the F. E. C.

Data Essential for Proper Comparison of Fuel Consumption are grade and curvature equated to equivalent of level tangent track; average weight of loaded and empty cars in direction of traffic; weight of train; B.t.u. of coal or oil used; steam factor of locomotives making mileage; climatic conditions; free running speed; number and location of stops with respect to time and distance required to accelerate, plus dead time at intermediate points; a separation of the fuel consumed in terminals from that used in transportation service, to develop the stand-by losses.

A Load Factor was developed for the 15 selected roads based upon fuel consumed as related to the amount of fuel that would have been required had the locomotives developed the potential horsepower during the time they were in active service. The results are not absolute because several factors had to be estimated. As the same method of estimating was applied to all alike, it is felt the data are relatively reliable, and it is the relative indication we now seek. For the western group the load factor was found to be 30.95; the southern group, 35.06, and the eastern group, 35.15. From this it appears that the eastern group worked the power 13.5 per cent harder than was done in the western group, and it would seem reasonable to assume that their cost of repairs would be higher by that amount, other factors being the same.

The Length of Run between Locomotive Roundhouseings has an important bearing upon the cost of locomotive repairs. No direct data are available on the subject. In a general way it is known that locomotive runs in the western group are longer than in the east, and this, therefore, justifies a higher cost for repairs in the east when compared with the western group.

An indirect method of testing this question is a comparison of the Roundhouse Expense, Accounts 388 and 400, for road and switching locomotives on a per-mile basis. For road locomotives only, Account 400, by groups, the southern was lowest—5.02 cents; western, 5.54 cents, and eastern, 7.36 cents, an increase of 32.8 per cent above the western group. For switching locomotives only, Account 388, by groups, southern was highest—7.96 cents; western, 7.39 cents, and eastern, 7.27 cents, or 1.6 per cent less than the western group.

The relationship between the cost of roundhousing switching and road locomotives shows the switching to be higher by 33.4 and 58.6 per cent, respectively, for the western and southern groups, while for the eastern group it was 1.2 per cent less. This may be accounted for on the basis that with a fixed switching service, as the distance between roundhousing road power increases, it automatically throws a larger portion of the overhead expense to the switching power. The same principle applies in a measure with respect to locomotive repair costs.

The Relation of Roundhouse Expense to Locomotive Repairs.—For Class I railways, for every dollar spent in Account 308, Locomotive Repairs, there was 26 cents spent for roundhousing, Accounts 388 and 400. By groups, the southern was lowest—24 cents; western, 25.7 cents, and eastern, 26.8 cents, a difference of 3.8 per cent, eastern vs. western group.

The Cost of Repairs per Locomotive-Mile has been recommended by the Locomotive Construction Committee of the Association of American Railroads as "satisfactory and sufficient" for the "practical means of regulating and comparing maintenance expenditures of locomotives." They also state there are "serious objections to the use of potential horsepower units for comparing costs of locomotive repairs." Before final judgment is passed upon this important matter, consideration is urged of the readily obtainable factual data as set up in four detailed tabulations in the report under the heading of "Cost of Locomotive Repairs per Locomotive-Mile and per Potential Horsepower-Mile as Related to Age of Use and to Size."

The cost per locomotive-mile was: F. E. C., 16.01 cents, and C. & O., 38.2 cents—a net difference of 138.6 per cent.

Relative costs per horsepower unit—i.e., a locomotive-mile

equated for size—was: F. E. C., \$0.6919; D. & H., \$1.7267—a net difference of 149.6 per cent.

The average horsepower of the locomotives was: B. & M., 1,644; Union Pacific, 2,533—a net difference of 54.1 per cent.

The relative age of use was: F. E. C., 3.8 years; D. & H., 20.8 years—a net difference of 447 per cent, or nearly five and one half times as old.

The Gross Tons per Locomotive-Mile as a basis for comparative costs of repairs, if used alone, is also elusive. While it in a measure eliminates the disparity existing in comparing train-miles, through the proper consideration of light and helper miles, it has other limitations as influenced by speed, and the number and location of stops, as well as weight of units and grade. For Class I railways the gross tons per locomotive-mile was 1,638; for the 15 roads, 1,715. By groups, the southern was lowest—1,437; western, 1,591, and eastern, 1,759. By roads the extremes were: B. & M., 1,161, and C. & O., 2,584, a net difference of 122.6 per cent.

Passenger service figures were evolved through the application of average tare weights for various types of passenger cars to the actual mileage reported to the Interstate Commerce Commission. For Class I railways the gross tons per locomotive-mile was 433; for the selected roads, 453. By groups, the southern was lowest—409; western, 431, and eastern, 443. By roads, the extremes were: C. & O., lowest—337, and the F. E. C., 710, or 110.7 per cent more than the C. & O.

The combined effect of freight and passenger service for Class I railways was 1,094; selected roads, 1,145. The southern group was the lowest—973; western group, 1,069; eastern group, 1,164. By roads, the extremes were: B. & M., lowest—707, and the C. & O., highest—1,988, a difference of 181.2 per cent.

The Gross Tons Per Horsepower Unit, Road Service Only, as it equates for size, makes a substantially different picture. These data were produced only for the 15 selected roads. For the selected roads it was 4,371. The two extremes were A. T. & S. F., lowest—3,664, and the C. & O., 6,608, a difference of 80.3 per cent, while the difference between these two roads on a per locomotive-mile basis was 67.4 per cent.

A Segregation of Locomotive Repair Costs as Between Back Shop and Roundhouse was kept by only 32 roads which reported that the back-shop costs ranged from 27 to 100 per cent. Eighty roads estimated it should range from 25 to 100 per cent. There are two schools of thought on this subject: One maintains that the total costs will be less if the back shop does 60 to 70 per cent of the total work; others have just the reverse opinion. Unfortunately, no reliable data were available on the subject.

Locomotive Repair Costs as Related to Ledger Value, as stated in the original study, showed that five years' repair equalled the ledger value. The A. A. R. Locomotive Construction Committee raised a question as to the difference in the dollar value as applied to purchase price when compared with the dollar spent for repairs. To meet this criticism the cost of reproduction new as of 1929 was calculated, and on that basis the relation was found to be 6.3 instead of 5 years.

Conclusions

The conclusions of the report and the recommendations made by Co-ordinator Eastman to the Association of American Railways are as follows:

(1) Nearly three-quarters of a million dollars per day are being expended by Class I railways for the repair and servicing of steam locomotives. This is an amount which is surely worthy of more careful analysis than is possible with the data now available.

(2) In order that railroad managements and directors may have a better basis by which to check and chart certain courses of procedure, there is need for uniformly prepared additional statistical data. It is also essential to have these if fair and proper comparisons are to be made between divisions of a given road, and more particularly if comparisons are to be made as between railroads.

(3) The difference in the wage-level of a typically selected group of maintenance-of-equipment employees, eastern vs. western group, was 6 per cent; the difference

in the hourly wage rate paid was 11.9 per cent, due to the eastern group's using a larger proportion of employees in the higher wage brackets.

On the basis that the labor costs are two thirds of the total costs of locomotive repairs, this explains 7.9 per cent of the 40 per cent higher repair costs in the eastern group during the three years 1927-1929, inclusive.

(4) The load factor, or utilized proportion of the locomotive's potential horsepower, as measured by fuel consumption, was 13.5 per cent greater in the eastern than in the western group and justifies that much increased cost, other factors remaining the same.

(5) The standard of maintenance given to active locomotives in the eastern group was lower than in the western group. This will account for an increased cost of repairs, but no data are available to indicate whether the condition was justified, nor is there anything known upon which to hazard an estimate as to how much it increased the cost of repairs.

(6) The average length of locomotive runs between roundhouseings was shorter in the eastern than in the western group. This, too, is an important factor which will account for an increased cost of repairs in the east. There was not enough information available, however, to warrant a definite estimate.

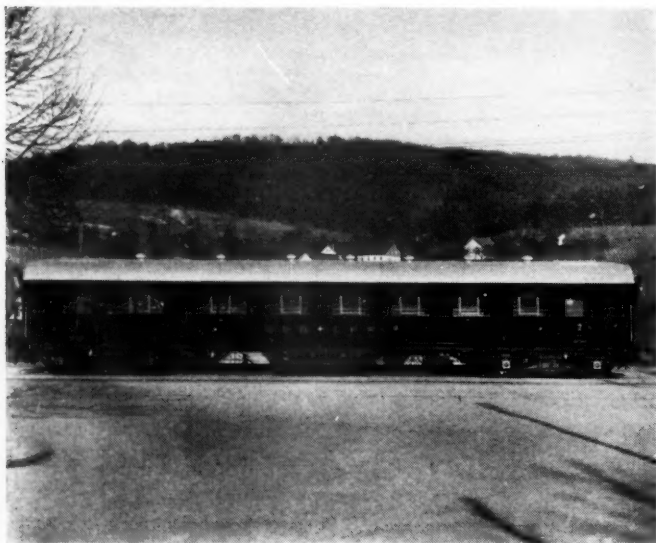
Recommendations

It is recommended that a committee of experts, preferably nine, representing the railroads, the locomotive builders, and the federal government, be appointed to make an early report upon the kind of information needed, the manner in which it should be kept, and the way in which it may be used with respect to (a) fuel economy, (b) locomotive utilization, and (c) the economic life of steam locomotives.

In order to give their undivided attention to the subject the committee members should be relieved of their customary duties for a period of at least two months. Necessary transportation and expenses to be furnished by the Association of American Railroads.

In addition to investigating the detail methods used by American railways, the committee should make a careful examination of the practices in vogue on at least the Canadian and English railways, where the subject has already been given much attention.

* * *



A New First and Second Class Passenger Car on the Swiss Federal Railroads

Average Per Diem Plan Promises Good Results*

By W. D. Beck†

It is gratifying to report that results so far obtained justify the average per diem plan, because, although comparative data are generally unavailable, we do have enough information in some instances to warrant the statement that actual performance based on comparisons of July and August, this year with last, show a ratio of saving which will develop about 200,000,000 less empty box car miles per year. Incidentally, and throughout the United States generally, there has been a decrease of about 12 per cent in the number of empty box cars passing through terminals, but we believe that this figure will easily run to 16 to 20 per cent at Chicago. There has been no material decrease in home cars on home roads, although a few railroads have suffered because their good Class A box cars have been held and improperly applied by other railroads. However, these instances are being straightened out satisfactorily.

How the New Per Diem Plan Works

The average per diem plan, now in use, was made effective by the Association of American Railroads on May 1, 1935. This plan is confined to box cars and includes ventilated cars but not automobile cars, it being well known that automobile cars and types other than box cars do not lend themselves in any perceptible degree to return loading.

The average per diem plan provides for a better utilization of box cars and for the reduction of empty box car mileage to a minimum, with naturally greater efficiency in the use of such equipment. All of the Class I railroads and some short line railroads participate in the plan, but a large majority of the short lines, or intermediate carriers, do not participate because they own few, if any, box cars.

Briefly, the average per diem plan contemplates that, instead of paying the amount named in Per Diem Rule 1 for each calendar day that cars are held on line, each participating road will pay to every other participating road an arbitrary amount equivalent to the average detention of each ownership on its line each month for the years 1932, 1933, 1934 and for each such car on its line during the month. In other words, taking October as an illustration, if the average payment per car for the three years mentioned was determined from the records and set up as an arbitrary (for example, \$4.01 per ABC car on the XYZ Railroad), such an amount is the arbitrary for that particular month thereafter, and so if the XYZ Railroad, in October, 1935, had 10 ABC cars on that line, they would pay the ABC Railroad 10 times \$4.01 for the month, regardless of the number of days that any one or all of the ABC cars were held during any particular month. Incidentally, if a certain car was on and off the railroad two or three times during that particular month, it would be counted as only one car. An exception was made in those cases where less than 30 cars of any foreign ownership were on a road during the test period, under which circumstances the general average of all cars would be used in settlements

(Continued on page 792)

* Excerpt from an address before the Car Foremen's Association of Chicago on November 11.

† District Manager, Car Service Division, Association of American Railroads.

Charles H. Ewing, President of Reading and Central of New Jersey, Dies

Succumbs to pneumonia on December 8 after a career covering more than 50 years of service with the Reading System

CHARLES H. EWING, president of the Reading Company and of the Central of New Jersey, died of pneumonia on December 8 at his home in Melrose Park, Pa. He was 69 years of age and had not enjoyed good health for several months although he continued to work until a few days before his death.

Mr. Ewing devoted his entire business life to the service of the Reading System with which he had been identified for more than half a century. He first entered its service in 1883 as a rodman on the Philadelphia & Reading and subsequently advanced through various engineering and operating department positions to the presidency of the Reading Company, the position to which he was elected in April, 1932, following the death of his predecessor, Agnew T. Dice. He became president of the Central of New Jersey in June, 1933, succeeding R. B. White who had resigned to assume the presidency of the Western Union Telegraph Co.

The Central of New Jersey is controlled by the Reading which owns some 53 per cent of its outstanding capital stock, which, however, was for several years held by trustees under court order. Since the two properties were included with the Baltimore & Ohio in the four-system consolidation plan approved by the Interstate Commerce Commission for eastern territory, however, both the court and the I.C.C. have consented to the withdrawal of the stock from the trustees and to the exercise of control by the Reading.

Thus the operations of the two roads, which had long been conducted in close harmony, were further co-ordinated during Mr. Ewing's regime. This co-operation extended also to rail-highway services since the Reading's highway subsidiary, one of the first of such companies to be organized, has operated its bus and truck routes in co-ordination with those of the Jersey Central's affiliate. Also, Mr. Ewing effected with the Pennsylvania the co-ordination of the Reading and Pennsylvania rail lines in Southern New Jersey into the Pennsylvania-Reading Seashore Lines. This consolidation, an outstanding example of railway co-operation in the interests of eliminating "competitive wastes," has brought important economies without any undue curtailment of services to the communities involved.



Charles H. Ewing

In addition to his activities in the foregoing connections Mr. Ewing guided the Reading and Central of New Jersey through some of the most difficult years of the business depression. He came to the presidency of the former early in 1932 when gross revenues were falling at a rate which, for that year, left them 46.7 per cent under the 1929 total. Yet expenses were so held in check that the 1932 net railway operating income was but 38.9 per cent less than that of 1929. The Reading continued in this fashion to meet problems of subsequent depression years and has been able throughout the period to pay dividends on its common stock, thus maintaining an unbroken record extending back to 1905. Likewise the Central of New Jersey, while it has encountered deficits during the depression, has nevertheless been able somewhat to mitigate such losses by an effective control of operating expenses. Its operating ratio, for example, has dropped from 72.62 per cent for the year 1929

to 69.77 per cent for 1934.

Charles H. Ewing was born at Pottstown, Pa., on May 28, 1866, and was educated in the Pottstown high school and by private tutoring in civil engineering. He began his railroad career on August 1, 1883, with the Philadelphia & Reading (now Reading Company), serving first as rodman and subsequently as assistant engineer and supervisor. On November 1, 1892, he became connected with the Central New England (now included in the New York, New Haven & Hartford), remaining with that company in the positions of division engineer and chief engineer for nearly 10 years before returning, on August 1, 1902, to the Philadelphia & Reading. Until June 1, 1905, he was division engineer, and from then until October 15, 1910, engineer maintenance of way of that road. On the latter date he was appointed superintendent of the Atlantic City Railroad, being promoted to general superintendent of the Philadelphia & Reading on January 1, 1913.

When Mr. Dice was elected president of that road on March 15, 1916, Mr. Ewing was appointed general manager, and, on December 1, 1917, he was further advanced to vice-president in charge of operation and maintenance. Except for the war period (June 15, 1918, to February 28, 1920), when he served as federal man-

ager of the Philadelphia & Reading, the Central of New Jersey and the Staten Island Rapid Transit, Mr. Ewing continued as vice-president of the P. & R. until its absorption by the present Reading Company on January 1, 1924. He was then elected to the same position with the latter company, and remained in that capacity until his election to the presidency. Mr. Ewing was a member of the Engineers Club of Philadelphia; the Board of Managers, Franklin Institute; and the American Railway Engineering Association.

Railway Development Association Meeting

THE twenty-seventh semi-annual meeting of the American Railway Development Association was held at the Palmer House, Chicago, on December 5-6, consideration being given to agricultural and industrial development. The constitution of the association was changed to provide for one meeting a year and two if necessary. Heretofore, the constitution has required the holding of two meetings a year.

Officers elected for the ensuing year were: President, H. J. Schwietert, general agricultural agent of the Illinois Central; first vice-president, J. A. Senter, industrial agent of the Nashville, Chattanooga & St. Louis; second vice-president, E. H. Gurton, manager of the land settlement and development department of the Canadian National; and secretary-treasurer, R. G. Buford, assistant manager of the industrial development department of the Missouri-Kansas-Texas.

At a luncheon on December 5, Robert S. Henry, assistant to the president of the Association of American Railroads, spoke on Transportation Costs and Public Policies, showing how taxes paid by railroads are an important factor in the maintenance of schools and other community affairs. At one of the general sessions, W. Y. Blanning of the Bureau of Motor Traffic of the Interstate Commerce Commission, analyzed the Motor Transport Act, describing the requirements under which motor carriers must operate. Other addresses at the general sessions were Raising Factory Crops for American Industry, by Carl B. Fritsche, managing director of the Farm Chemurgic Council, Dearborn, Mich.; Some Live Stock Marketing Problems of Today, by R. C. Ashby, associate chief of Live Stock Marketing of the University of Illinois; Problems of Live Stock Improvement, by Col. E. N. Wentworth of Armour & Co., Chicago; and the Texas Centennial—1936 by R. G. Buford.

At the industrial session meeting, discussion was devoted to the decentralization of industry due to a more extensive use of trucks and traffic requirements, industrial conditions in various sections of the country and individual problems of industrial developments.

At the agricultural session meeting, agricultural and general conditions throughout the country were discussed, while consideration was given to farm tenantry, land settlement and the live stock loss prevention campaign.

CEREMONIES MARKING THE FORMAL OPENING of the new combined railway and highway bridge across the Mississippi river at New Orleans, La., are to be conducted on December 16. This bridge, which is known as the Huey P. Long bridge, is the largest and most costly bridge to be constructed across the Mississippi river. It was described in detail in the *Railway Age* of September 14, 1935, page 326.

Average Per Diem Plan Promises Good Results

(Continued from page 790)

with those railroads whose equipment on the settling road was less than 30 units.

The Transportation division issues a circular to all participating railroads monthly which contains a table showing the average detentions to be applied between individual participating carriers. It may be said in passing that these general averages are approved by a certification committee which has been created for each group of railroads.

Principles of the Average Per Diem Plan

There are no changes in the car service rules, so foreign box cars must still be used for off-line loading versus system cars, but, of course, in the direction of home. A road haul carrier has the right to provide cars for loading on switch lines when the load is destined to or via such road haul carrier. It is contemplated that carriers, generally, will require shippers to place orders for their cars so that proper ownerships may be provided.

It is expected that railroads will carefully observe ownerships in the spotting of equipment at freight houses and other places where control of loading is unquestionably in their hands. The opportunity to hold foreign cars a reasonable length of time in any one month makes the two preceding paragraphs capable of efficient policing. Commodity carding, if generally observed, will be of material assistance to the plan. It is contemplated that the car departments will be of great service in this matter of commodity carding, or whatever plan is used, so that high class cars shall not be used for products otherwise capable of being carried in poorer equipment and that damage to good cars caused by loading objectionable commodities may be avoided.

As previously indicated, the plan permits the holding of foreign cars, and the time so held must be interpreted by each carrier in accordance with the car location; the volume of business offered for shipment; any stringency in the supply of box cars on the owning road; the flow of system empties; and other transportation situations which have a bearing thereon. There is no change in short routing arrangements, such as have been in effect for some time and such as are capable of improvement.

It is understood that any inequality arising, which seems to cause difficulty or loss on a particular railroad, is to be adjusted under Per Diem Rule 19. It is also definitely understood that the Car Service division forces are at the call of any railroad.

Naturally, there are criticisms of the plan, but most of these arose because an unusually heavy loading developed just after the plan became effective, and some railroads, unwisely we think, held foreign cars improperly, thus causing the owners considerable difficulty. To a large extent, this situation has been corrected and, with one or two exceptions, railroads report that their cars are coming home with greater promptness.

Another criticism is that railroads will depend upon the use of their neighbors' box cars and thus no such new equipment will be purchased, but we believe that the record of purchases to date shows the fallacy of this criticism. It is well known that unless cars are kept in repair, any plan will fail; but our canvass of the situation indicates that the railroads are alert, and the Car Service division contemplates a watchful attitude towards repair policies for the purpose of promoting maximum success with the average per diem plan.

Business Leaders Discuss Rail Outlook

Comment on many phases of situation included in messages received by New York Railroad Club on occasion of its sixty-third anniversary dinner

RAILWAY executives, industrialists, financiers and publicists this week made the New York Railroad Club's sixty-third anniversary dinner the occasion for comment on many phases of the railway outlook. Messages in that connection were received by the Club from leaders in these fields and were distributed in pamphlet form to the 2,600 persons attending the dinner, which was held at the Hotel Commodore, New York, on Thursday evening, December 12.

C. E. Smith, vice-president of the New York, New Haven & Hartford and president of the Club, presided. In his annual message, President Smith told how the railways, during the past year "have shown their ability to keep pace with the needs and desires of their customers." He cited in this connection the ever-increasing speed of passenger trains, improved operating methods, the development of light-weight equipment and the "fillip" which streamlined trains have given "the romance of railroading." He was therefore gratified to note that the shippers have "been saying it with carloads"—a manifestation, he added, which "definitely kills the pessimistic prediction that the railroads have yielded first place to the trucks."

J. J. Pelley, president of the Association of American Railroads, referred to recent carloading figures as a basis for his prediction that "a continuing increase in traffic will require equipment rebuilding programs, as well as the acquirement of new equipment"—a development which is already being forecast "by the equipment renewal programs of several railroads." Continuing, Mr. Pelley recognized, first, the responsibility of the railroads themselves for the solution of the industry's problems, but he stressed also the responsibilities of the public, the shippers and the regulatory authorities. He predicted, in closing, that "with the present operating efficiency," a reasonable traffic increase and equality of opportunity, "the difficulties of the railroads will be largely solved."

W. H. Cameron, managing director of the National Safety Council, called the railway safety record an "amazing" one, "which should stand as a model before the whole nation in the present hue and cry for the reduction of accidents." Mr. Cameron continued to review this record briefly, showing how the railroads through a program of "long, patient training, coupled with continuous safety education and unrelenting disciplinary control . . . have stigmatized accidents and made them unfashionable," inspiring such confidence that the public has "eagerly accepted" recently expedited railway passenger services. In this record Mr. Cameron finds serious food for thought for the motorist who must "learn the lesson exemplified by the railroads."

W. A. Irvin, president of the United States Steel Corporation, after citing the importance of railway purchases to the steel industry, stated that the time has come when that industry looks forward "to an ascending scale of purchases in 1936 and beyond"; railway modernization programs, augmented by normal replacement, he added, "promise to accentuate the importance of the railroads as consumers of steel." As an example of the steel industry's co-operation Mr. Irvin continued to point out how new light-weight materials have been

made available to railroads; and he pledged the continuance of the co-operation which "has been the watchword of our dealings in the past."

Samuel O. Dunn, editor of *Railway Age* and chairman of the Simmons-Boardman Publishing Company, warned of the dangers of government ownership of railways, not because he thinks that the present railway crisis will result in public control but rather because he regards it as "foolish to ignore the danger." Thus, while he pointed out, on the one hand, that "No industry can permanently remain under private ownership which cannot earn enough to pay all of its expenses, including taxes and interest;" he added, on the other, that "A sharp setback to the drift toward government ownership has been given by the recent increase in net operating income." Also, Mr. Dunn holds that the recent improvement in business has been due "entirely to natural economic causes . . . in spite of government policies adversely affecting all business;" and he is confident that the increase in railway gross and net earnings "will continue at least during the first one-half of 1936."

Edward Hungerford, author of books on railroading, director of the Baltimore & Ohio's Fair of the Iron Horse and author and producer of *Wings of a Century* at Chicago's Century of Progress exposition, divides the railroad problem into three factors—service, rates and publicity. And he thinks that now is the time "to publicize or dramatize the American railroad, as it has never been done before;" that the time is ripe for "a great railroad show—not a general transportation show, but just a railroad one." He bases this belief on the "overwhelming success" of the Fair of the Iron Horse, holding that the thing could be done again in the near future.

F. J. Lisman, chairman of the Lisman Corporation, New York, called upon the investor in railway stocks—the "forgotten man"—to organize and "become articulate like the 'gimme' clubs of all kinds." Only in that way, he continued, can stockholders influence the enactment of sound transport legislation, and "assert themselves with the management of the carriers with a view to eliminating competitive wastes of all kinds." It is Mr. Lisman's view that "lack of cohesive organization" among security holders promotes the drift toward government ownership which, according to principles laid down by Senator Wheeler, would leave present stockholders with "substantially nothing but preferred stock preceded by income bonds."

Philip A. Benson, president of the Railroad Security Owners Association and president of the Dime Savings Bank, Brooklyn, N. Y., stressed the tie-up between the railroad problem and "the national public interest," citing in this connection the railway investments of insurance companies and savings banks. He continued to discuss unsound regulatory and managerial policies, holding that "The great question is whether the handling of the railroad problem, both in its managerial and regulatory aspects, can be sufficiently divorced from the fixed pattern of the past to permit of a system sufficiently flexible to meet the needs of the country. . . . Without evidence of a clearer appreciation of the needs and difficulties of the railroads, there can be no material revival of investor confidence."

Communications . . .

Depression, Not Competition, Chief Factor in Traffic Loss

TO THE EDITOR:

NEW YORK.

You have carried several letters in your Communications section with reference to my article entitled "Factors Which Underlie Railway Traffic Revival." It is my feeling that those who have criticized this study are under the impression that I consider none of the traffic lost to highways, airways, pipe lines or waterways, important.

Now, I am naturally not in sympathy with those political mountebanks who are constantly arguing for more extensive inland waterways, and I believe the entire federal attitude on inland waterway operations nothing short of disgraceful. I cannot help but believe that the letter written by "Observer" indicates that he considers that I am attempting to prove that there has been no diversion to the waterways, and perhaps am an ardent enthusiast for the Inland Waterways Corporation.

The traffic which has been diverted is naturally important, but a recovery of such traffic for a railroad like Illinois Central or the Missouri Pacific would not solve these carriers' problems. In the case of the Illinois Central I might state that the decline in gross revenues from \$186 millions in 1926 to an indicated level of around \$96 millions for 1935 is primarily due to natural depression causes and is not alone due to a loss of \$20 millions in passenger business and another loss in gross due to waterway competition. I continue to maintain that the total traffic now carried on the Mississippi river is not important in comparison with the amount of tonnage lost to all railroads as a result of lower production of pig iron, lumber, cement, and a tremendous shrinkage in the volume of manufactured and miscellaneous freight shipments.

Another writer in your column pointed out the loss in passenger revenues of the 'Frisco Railroad, of which I am fully aware. I surmise that the big reduction in earnings from this source has increased the passenger ratio disproportionately and that a difficult problem confronts the operators. In most cases few western railroads, even in 1929, were able to operate passenger services at a profit, and thus the greatest problem has been that of increased operating expenses in connection with passenger train operations which had to be continued. Here again this diversion, or loss, is important, and the loss in passenger revenues is important to all railroads and I cannot quarrel with any statements with respect to the amount of tonnage diverted or lost to competitors since 1929.

I do object, however, (and it was these objections which prompted the writing of the article on revival in railway traffic) to the statement that carloadings will never return and will most likely hold their current level for many years to come because the motor trucks, inland waterways, passenger automobiles, buses and pipe lines have diverted all the profitable business. The facts as contained in Docket No. 26712, the famous Barge Line case, are clear, but it is in the interpretation of such facts that various railroad analysts are in conflict.

"Observer" points out that three important barge lines in 1934 handled 2,096,002 tons of freight. Since 1930 originated traffic has declined from 1,153,196,636 tons of freight to 765,295,920 tons, or a net reduction of 387,900,716 tons. Thus the significant tonnage pointed out by "Observer" amounted in 1934 to two-tenths of one percent of the total loss in traffic during the period. Even this small loss is important, but it does not explain the major reasons for the decline in railroad traffic and by pointing out these significant facts those who still believe in the future of railroads find nothing to clarify the factors or facts which will determine railway traffic revival.

If we go further and assume that these three barge lines in 1934 diverted 2,096,002 tons of freight and that every ton was diverted from the Illinois Central, we find that of the net reduction in Illinois Central's revenue tonnage between 1928-1934 of around 27 million tons, that this would amount to only about 7 percent of the total loss sustained by this road during this period, and under this assumption we are assuming that in the year 1928 there were no rivers and no barges. As a matter of

fact, we know from the records that in 1928, and according to "Observer," the Federal Barge Line and the American Barge Line handled a total in all commodities of 2,045,222 tons. Where then did Illinois Central's traffic go between 1929 and 1934 which would account for a drop from 62,750,085 tons to 35,655,879 tons of revenue freight in 1934?

In conclusion, let me say that I am only interested in getting the true facts surrounding this debatable subject. It is my earnest desire that in the future the railroads will be able to meet competition irrespective of the source and maintain their importance as carriers of the nation's freight. Moreover, I am just as anxious to see river competition ended and unrestricted operations on the highway reduced as anyone, and I certainly do recognize that these factors are important and that any traffic which is diverted is in reality important even if it is only one ton or one passenger.

One interested party wrote me after the publication of this article and said that I had failed to consider the vast tonnage hauled on the Great Lakes, despite the fact that I had pointed out that most of this business was coal or ore traffic and that unfortunately it had never been available to the railroads for shipment and that in all probability it never would be.

I hope I shall have the opportunity of going over in detail any facts or figures which can prove to my satisfaction that the great reason for the decline in traffic on American railroads is due almost entirely to increased competition and not to reduced production of every basic commodity. Our governmental experimentation has stimulated consumers' goods, but recovery in the heavy industries is still a long way in the future and herein lies the key to traffic recovery.

JOHN LEEDS KERR.

Who Agrees with Mr. Turney?

GLEN ELLYN, ILL.

TO THE EDITOR:

One would like to ask what reaction there is, if any, on the part of railway managements to addresses like that of J. R. Turney, entitled "The Railways Can Come Back," published in the *Railway Age* for October 12.

The claim may be made that he is prejudiced, being formerly of the staff of the Co-ordinator, but it can hardly be sustained that he is neither familiar with nor accurate in his statements of conditions which are only too well known to the shipping public.

There was not a single unfortunate condition mentioned concerning which at least a start could not be made by way of correction, and that immediately, but there is no evidence and little prospect of anything being done. The obvious path of least resistance is to go along in the same old way, and that is the broad highway to bankruptcy which the railways have been following with scarcely an intelligent effort to save themselves by way of regaining public goodwill other than some air-conditioning and some fast and costly trains.

In one respect Mr. Turney was probably wrong. Railroad transportation should not be "sold" in an exploitative sense as it is an essential public service. There are certain mediums of commercial activity such as transportation of all kinds, banking and insurance which are essentially governmental functions, but if there is any virtue in expediency it is just here in keeping these mediums out of bureaucracy of the particular kind of government we have. The railroads owe a duty to the public to do so.

The railroads are not headed for government ownership as a whole but unless they co-operate to help themselves collectively they are headed for a chaotic mixture of public and private operation with the public the resulting victim. Here again it is the duty of the railroads to avoid this. With the will to act, a more elastic mentality, and with a centralized advisory control to which the individual roads will listen, about 60 percent of the railroads within three years can be placed on an earning basis of a reasonable valuation, 25 percent allocated as feeders, and the balance abandoned in favor of better service through highways.

The railways can come back—if they will to, but they can not do so by sitting still, pretending to be the victims of "New Dealers" or "Old Dealers" or a "forgotten" industry.

WM. D. SHIPMAN.

Odds and Ends . . .

Railway Birdman

M. H. Zeagler, telegraph operator for the Illinois Central at McComb, Miss., is one of the few licensed pilots in railway service.

Railway Aviator

Kenneth Brown Collings, war-time ace and at present war correspondent in Ethiopia for a national magazine, announced in a recent interview that he got his taste for travel and adventure serving as a rodman for the Southern.

Who Names Cars?

Much has been written in lighter vein regarding the naming of Pullman cars. However, this department's entry for the most peculiarly-named car is the Canadian National parlor car operating between Montreal and Portland, which rejoices in the name Batchewaung.

Free Riders

When the Berlin-Hamburg line in Germany was built in 1842, the good burghers of Lauenburg were much perturbed because it did not pass through their town. To pacify them, the railway gave the town the right to travel free on the ten-mile branch between their city and the main line, and the citizens of Lauenburg still possess this privilege.

Railway a Life Saver

The brakeman and conductor of the Columbine, of the Chicago & North Western, are credited with the rescue of five Sterling, Ill., youths who were thrown into Rock river near Sterling when their sailboat overturned. The brakeman was in the baggage car as the train sped eastward toward Chicago. He saw the sailboat capsize and rushed back to tell the conductor. The two wrote a note telling of the accident and three miles farther on, at Nelson, they tossed it from the train, waving to the towerman at Nelson. He read the note and quickly telephoned the telegraph office in Chicago, 108 miles away, whereupon that office notified the Sterling fire and police departments and boats were sent to the scene to bring the youths ashore.

Brothers' Service Record

The four Urquhart brothers of Roanoke, Va., all employees of the Norfolk & Western, challenge any four brothers on any railroad to beat their service record. The brothers have a combined total service of 175 years. L. H., 66, a gang leader in the Roanoke shops and the oldest of the quartet, started to work for the N. & W. when he was 19. He has a record of 47 years. G. A., 64, a gang leader in the shops, also started to work for the railroad when he was 19. He has a service record of 45 years. L. D., 62, an engine carpenter in the Roanoke shops, likewise entered N. & W. service at 19. He has worked for the railroad 43 years. C. E., 61, a passenger conductor on the Shenandoah division, was 21 when he started to work for the railroad. He has served 40 years. If the four brothers work to the retirement age of 70, they will have served the Norfolk & Western a total of 202 years.

B. & O. Influences Austrian Railway

The one-hundredth anniversary of the B. & O.'s Thomas Viaduct, at Relay, Md., recalls an important chapter in railway history almost unknown to the present generation; namely, that the building of the B. & O. over the Alleghenies had a decisive influence upon the construction of the world's first large mountain railroad, from Vienna south over the Semmering, in Austria.

An extensive book of 264 pages is entitled "The Baltimore-Ohio Railroad over the Allegheny Mountains and the North American Locomotives, investigated by C. von Ghega." It was

published in 1844, in Vienna, with a large atlas containing nineteen maps and drawings, and it gave the account of its author, von Ghega, his investigation of the B. & O. and his argument and proof that the gigantic Austrian project of climbing the Semmering should be based upon the use of steam locomotives, contrary to the current opinion of other railway experts at that time. In 1841, von Ghega was sent to the United States to make a detailed study of conditions, so that the method of traction might finally be determined.

On the B. & O. von Ghega found what he was looking for. The road had then progressed to Harper's Ferry (81 miles), and in Ghega's presence the further 42 miles to Hancock were opened to service. So well did Ghega's observations serve his



A Typical, Massive Semmering Viaduct

purpose that, co-ordinating them with his own genius, his solution for the Semmering Railroad, for which he chose 2½ per cent grades and 9½ deg. curves, became the model mountain railroad of Europe, in addition to being the first enterprise of its size and difficulty in the world, and one of the most beautiful and successful.

Nine years after Ghega returned from America, the wild rocks of the Semmering echoed and re-echoed the exhausts of four rival locomotives, which vied for the prize instituted by the Imperial Government, following another B. & O. example of 1831. The conditions were severe, 155 tons over a 3 per cent effective grade (including curve resistance), at not less than 7½ miles per hour, but they were exceeded by all competing engines. European locomotives were then much heavier and two to three times more powerful than their American sisters. Several decades later the picture changed the other way around. Ghega triumphed over all his enemies, who only two years before the contest, had urged the legislative council to stop the building of the mountain line as a wilful and reckless waste of funds. The B. & O. had shown him the way, and the value of international interchange of experiences had proved itself.

NEWS

Two More "Streamliners" Ordered by Union Pacific

Will be in operation next June between
Chicago and Denver on a 16-
hr. schedule

Two more streamlined trains have been ordered by the Union Pacific from the Pullman Standard Car Manufacturing Company. They will be placed in service between Chicago and Denver, Colo., in June on a schedule of 16 hrs. for the 1,048 mi. via the Chicago & North Western and Union Pacific, effecting a saving of a business day or nine hrs. as compared with the present fastest schedule, 25 hrs., 15 min. eastbound.

The new trains, to be known as "Streamliner—City of Denver" will leave Chicago and Denver every day in late afternoon, arriving at the terminals the following morning, arrival and departure at Chicago being arranged to allow ample time for passengers to make connections with eastern trains. With an average speed of 65.5 m.p.h., including stops, this train will be the fastest in the world for distances of 805 mi. or more. No extra fare is contemplated and low cost individual tray-meal service will be available in addition to regular dining car service.

Each train will consist of a 2400-hp. tandem power unit and 10 cars, including three Pullman sleeping cars, a Pullman room and observation car, a dining car, two coaches, equipped with adjustable, reclining seats, and three cars for baggage, mail and express. Each section of the power unit will contain an Electro-Motive Corporation 1200-hp. Diesel engine, directly connected to generators, which will provide current for electric motors on each truck of the power cars. Each of the tandem power units will be so arranged that both engines or either individually can be operated from the controls in the cab of the first unit. The overall length of the trains will be 858 ft. and the total weight about 600 tons. Passenger capacity will be 82 in the Pullman cars and 100 in the coaches, or a total of 182. Externally the passenger-carrying cars will be of standard width, but the interior, by reason of the type of design, will be five ins. wider than present standard cars and of same height.

The power cars will be built of Cor-Ten steel furnished by the United States Steel Corporation, while the principal structural material of the other cars will be aluminum alloy, except that the trucks, complete and couplings between cars, will be steel. The aluminum alloy used will be furnished

by the Aluminum Company of America.

These two additional streamliners when completed will give the Union Pacific a fleet of six such trains—two for service between Chicago and Denver, one between Chicago and Portland, Ore.—two between Chicago and San Francisco, Calif., and Los Angeles, and one between Kansas City, Mo., and Salina, Kan.

Signal Section March 9

The Signal section of the Association of American Railroads will hold its annual meeting at the Stevens Hotel, Chicago, on Monday and Tuesday, March 9 and 10, 1936.

I.C.C. Operating Statistics to Be Revised

The Interstate Commerce Commission, Division 4, has issued an order revising the forms on which operating statistics are to be reported monthly, effective on January 1, and annulling the previous orders issued in 1920, 1922, 1924, 1927, and 1929.

Eastern Time at Chicago Discussed

Railroad representatives met with the Eastern Time committee of the Chicago Association of Commerce on December 9, to consider the revision of train schedules to conform to Chicago's new eastern standard time ordinance. Another meeting will be held within two weeks, at which time an attempt will be made to adjust train schedules to business requirements.

Anti-Pension League Being Formed Among A. C. L. Employees

Employees of the Atlantic Coast Line are organizing an "Anti-Railroad Pension Tax League" for the purpose of testing the constitutionality of the railroad retirement act of 1935 and its companion tax act. Petitions have been distributed to A. C. L. employees to be signed by those desiring to join and who are willing to donate a nominal sum to a fund being raised to finance the contest. Accompanying the petition is a pamphlet entitled "Facts Relating to Federal Railroad Pension Plan."

Pittsburgh Railway Club Meeting

J. Steele Gow, director of the Maurice and Laura Falk Foundation, Pittsburgh, Pa., will address the Railway Club of Pittsburgh at the Fort Pitt hotel, Pittsburgh, on Thursday evening, December 19, on Income and Economic Progress. Mr. Gow will discuss the survey of the American economic system made by the Brookings Institution under grant from the Falk Foundation.

C. N. R. Trustee Set-Up Questioned by C. D. Howe

Railways minister wants to have some
say in shaping policies of
public-owned road

The new Canadian government at Ottawa will stand for the board of trustees kind of administration of the Canadian National, but it will not tolerate a situation where a government which has to find the money for that road is virtually unable to change the personnel of the board if in the opinion of that administration the personnel should be changed. Under the law passed by the previous administration the C. N. R. was placed in charge of three trustees, who were appointed for five-year terms which will not expire until 1938.

This was in effect the view expressed by Hon. Clarence D. Howe, Minister of Railways and Marine at Ottawa, in an address to the Railway Club in Toronto last week-end. He declared he would not countenance legislation that made a "rubber stamp" of the government. He hinted quite plainly that he would change the legislation at the coming session of parliament and it is believed that the present composition of the board will be changed and probably some of the machinery set up by the Bennett Ministry.

The system of "remote control, a sort of absentee landlordism" vested in the Minister of Railways by the act under which trusteeship of the Canadian National was set up, does not "accord with the principle of governmental and ministerial responsibility," in the opinion of Mr. Howe.

At one point in his address to the Toronto Railway Club Mr. Howe said: "It will be the duty of the present Government, in the public interest, to seek some more suitable and satisfactory system of direction and control of our great railway investment."

The new Minister said he had no objection to accepting complete responsibility for ministerial and departmental policies in the making of which he had a voice, "but I have decided objection to assuming responsibility for matters of such grave importance, in the direction and control of which the Minister of Railways is evidently expected to be more or less of a rubber stamp."

He quoted from the 1933 legislation under which "the trustees shall appoint, on terms to be fixed by them, and with the titular rank of president," a chief

(Continued on page 800)

Dominion Considering Motor Carrier Control

Provincial delegates meeting at Ottawa may favor British basis for truck taxes

Regulation and taxation of motor carriers is an objective of the present Canadian government, it would appear from statements made by the Minister of Railways, Hon. C. D. Howe, to a deputation of railwaymen who called upon him at Ottawa last week. Among other things, the delegation urged that buses and trucks should be taxed on the scale in force in Great Britain.

The Minister announced he would endeavor at the Dominion-provincial conference meeting this week to achieve agreement on a plan for uniformity of legislation governing commercial operation of trucks and buses in the Dominion and provincial spheres. Considerable variance exists at present in regulations of the Dominion and the provinces regarding motor vehicle transportation, whose business ramifications have grown into three fields, provincial, interprovincial and international.

"Possibly a Royal Commission may be named to examine the whole situation of the use of trucks and buses on public highways," Mr. Howe told the delegation.

The representations of the delegation which submitted that steam railways were operating at a serious disadvantage in competition with trucks and buses, would be placed before the Dominion-provincial conference, he promised.

A number of proposals were urged by the deputation, among them the following:

Truck and bus operation should be placed under the jurisdiction of the Board of Railway Commissioners, Canada, as was the case with railways, or under a similar body set up by each province.

Buses and trucks should be taxed on the scale in force in Great Britain. Regulations should be tightened so that no licenses would be issued to transport vehicles unless specified provisions were complied with by the applicants.

All applications for truck and bus licenses should be investigated by the Board of Railway Commissioners or a similar provincial body so that "if the railways are giving the necessary services, or a motor company is already operating over the route sought, no licenses be granted any applicant for a trucking or bus service in that particular territory."

Private trucks of manufacturers and similar firms should be taxed "on a slightly lower figure than the public commercial vehicle licenses." These firms were operating trucks from various centres, practically throughout Ontario, and "are certainly not paying their fair proportion for the upkeep of the highways they use," the delegation said.

Provisions which should be met, the delegation claimed, before licenses were issued to transport vehicles included: furnishing of a liability insurance policy or bond of indemnity for protection of passengers and consigners, and a cash deposit

for faithful performance of conditions attached to each license.

Ontario and Quebec representatives of bus lines were promised by Mr. Howe that full consideration would be given to their contention that the bus industry was regulated amply by provincial governments and required no additional regulatory steps by the Dominion.

U. P. Purchases \$1,000,000 in Stamps

What is believed to be the largest order for a single denomination of stamps ever placed with the government is that of the Union Pacific for 33,333,333 three-cent stamps of the Boulder Dam Memorial issue. The order was placed by the railroad, which serves Boulder City, Nev., the dam site, to make sure the stamps are given wide circulation during the year.

Reduced Rate on Apples Found Justified

Over the protest of southern railroads and apple shippers in Virginia and West Virginia, the Interstate Commerce Commission has issued a report finding justified tariffs proposing an extension of the temporary rate of \$1 per 100 lb. on apples from the Pacific coast to destinations in Illinois, Indiana, and a part of southern territory which had been suspended.

Hand Book for Loading, Bracing and Blocking

The Transportation division of the Association of American Railroads, Chicago, has issued a hand book of recommended rules for the loading, bracing and blocking of freight, which is being distributed to shippers in order to familiarize them with the most efficient methods developed by this division and the Freight Claim division. Care of lumber for bracing and blocking, nails and nailing, blocking and bracing, dunnage, and metal ties are discussed. Numerous drawings indicate the proper application of the rules.

Labor Organizations Seek Agreement with Railroads on Employment

The Railway Labor Executives' Association, at a meeting in Washington on December 5, appointed a committee to confer with the Association of American Railroads on the question of protecting the interests of the railroad employees in connection with consolidation or unification projects. George M. Harrison, chairman of the association, said an effort would be made to negotiate an agreement by which men would not be displaced without compensation but that if the effort fails Congress will be asked to pass permanent legislation to take care of the situation. The labor leaders at the meeting also drafted a series of recommendations to Co-ordinator Eastman as to his plan for unemployment insurance for transportation employees, taking the position that such proposed legislation should provide for at least half normal wages or a minimum of \$25 a month for at least six months, to be paid for by a tax on the industry and to be administered by the Railroad Retirement Board. The plan is being considered as a substitute for the provisions of the social security act which apply to employers generally.

Burlington to Employ "Firemen" on "Zephyrs"

Capitulates to B. of L. E. demand while union agrees to one man on Diesel switchers

A strike of 1,500 members of the Brotherhood of Locomotive Firemen and Enginemen on the Chicago, Burlington & Quincy, scheduled to take place on December 9 at 6 p.m., was averted on December 8, after a conference attended by Judge James W. Carmalt of the National Railway Mediation Board; L. O. Murdock, assistant to the executive vice-president, and W. F. Thiehoff and J. H. Aydelotte, general managers of the Burlington; and M. Larson, general chairman, and J. P. Farrell, vice-president of the firemen's brotherhood. As a result of the agreement reached, a helper will be employed to assist the engineman on Diesel-electric streamlined passenger trains and the brotherhood will not insist that a helper be employed on Diesel switching locomotives.

In this controversy, the brotherhood demanded that the railroad employ a fireman in addition to an engineman on both Diesel-electric trains and Diesel-electric switchers, contending that the employment of two men was essential to safety. The management held that employee and public safety was not jeopardized when such locomotives were operated by one man and that, by calling a strike, the brotherhood was trying to evade the contract which provides for a 30 days' notice for changes in present agreements.

On December 3 the brotherhood notified the railroad that a majority of its 1,500 members were in favor of a strike, and asked for another conference with the management. This conference took place on the following day and when the railroad would not waive its rights under the Railway Labor Act, the brotherhood set the date for the walkout at 6 p.m. on December 9. Shortly after the strike call was issued, Dr. William Leiserson, chairman of the National Mediation Board in Washington, telegraphed Ralph Budd, president of the railroad, urging mediation of the controversy. Mr. Budd interpreted the message of the chairman to mean that the brotherhood wished to change existing agreements which, in accordance with established custom, opened existing schedules for consideration of such other changes as may be submitted by the road.

On December 8, both parties agreed to waive their rights and the brotherhood agreed to withhold its demands for enginemen on switching locomotives. The management felt that, while its streamlined trains are safe when operated with one man, it would not contest the employment of a helper because of its high regard for safety and in view of the doubt already created in the mind of the traveling public through the publicity given the controversy.

Central of Georgia Centennial

The centennial of the Central of Georgia will be celebrated next week in various communities served by that road. The

anniversary date is December 15, since it was on December 15, 1835, that the first rail was laid at Savannah, Ga. The principal celebration will be in that city, where the Central of Georgia Employees Club has arranged a program covering several days and including a pageant on the history of transport.

In commenting on the event, H. D. Polard, receiver for the road, calls the celebrations unique "in that they were conceived and are being carried out by the employees of the railroad in co-operation with patrons and friends among the public."

Fourth Section Relief Denied on Export and Import Rates

The Interstate Commerce Commission has denied applications of railroads serving New Orleans for authority to establish and maintain export, import, and coastwise rates between interior points in Texas and New Orleans and points taking the same rates, without regard for the long-and-short-haul clause. The New Orleans lines had asked for relief in order to equalize the Texas and Louisiana ports. Commissioners Meyer and Aitchison dissented.

Steam Railway Accident Statistics August, 1935

The Interstate Commerce Commission's completed statistics of steam railway accidents for the month of August, 1935, now in preparation for the printer, will show:

Item	Month of August 1935	8 Months ended with August 1935	8 Months ended with August 1934	8 Months ended with August 1934
Number of train accidents . . .	487	479	4,213	4,123
Number of casualties in train, train-service and non-train accidents:				
Trespassers:				
Killed	340	326	1,872	1,853
Injured	367	397	2,167	2,251
Passengers on trains:				
Killed	1	2	13	17
Injured	178	205	1,300	1,175
Employees on duty:				
Killed	50	50	362	366
Injured	1,391	1,438	10,536	11,385
All other non-trespassers:*				
Killed	138	135	1,055	1,036
Injured	433	506	4,076	4,120
Total — All classes of persons:				
Killed	529	513	3,302	3,272
Injured	2,369	2,546	18,079	18,931

*Casualties to "Other non-trespassers" happen chiefly at highway grade crossings. Total highway grade-crossing casualties for all classes of persons, including both trespassers and non-trespassers, were as follows:

Number of accidents	248	246	2,291	2,270
Persons:				
Killed	130	124	983	951
Injured	246	298	2,695	2,611

Illegal Train Riders

During October, 403,504 illegal train riders or trespassers were removed from trains, prevented from getting on trains or ejected from railroad premises but not arrested; as compared with 537,472 in September, 659,856 in August, 674,115 in July, 635,307 in June and 530,099 in May. This record has been compiled by the Protective and Safety sections of the Association of American Railroads. The decrease is attributed to the fact that the "intake" at

federal transient camps throughout the country was closed on September 20. As a result, September shows a drop of 18 per cent in the number of illegal train riders, as compared with August, and October shows a drop of 24 per cent, as compared with September, and 40 per cent as compared with the peak month of July.

N. Y. C. Building Streamlined Train for Cleveland-Detroit Run

The New York Central is now constructing in its own shops a streamlined steam train which will be placed in service next spring between Cleveland, Ohio, and Detroit, Mich., via Toledo, on a round-trip daily schedule of approximately a mile a minute, an hour faster than present schedules, for the 164.2 miles each way.

The new train, to be air-conditioned throughout, will consist of seven cars, embodying "every device for safety and comfort." The cars are being built in the road's car shops at Indianapolis, Ind., while the locomotive is under construction at its West Albany (N. Y.) shops. The latter will be a high-speed Pacific type and its design will differ considerably from those of the New York Central's first streamlined steam locomotive, the Commodore Vanderbilt, which now hauls the Twentieth Century Limited between Toledo and Chicago; it will have roller bearings on its truck, trailer and tender wheels.

The train will not be articulated, but will consist of a combination baggage car, two coaches, a dining car, providing full dining facilities, a lounge-bar car, and Pullman parlor and observation cars. In each car will be embodied a number of changes from the ordinary floor plan. All cars will be of steel, but with substantial weight reductions compared with standard equipment. No name for the new train has yet been selected.

Diesel Engine Fire Caused By Fuel Tank Overflow

Following an investigation, it was determined that the fire which occurred on the forward unit of the 3,600-hp. Diesel-electric locomotive hauling the Santa Fe "Super-Chief" on a test run between Chicago and Los Angeles, Cal., as reported in the *Railway Age* of November 23, was caused by the combustion of vaporized fuel oil accidentally introduced into the engine-room and ignited by one of several means not definitely determined. An excessive amount of fuel oil was transferred from special reserve tanks in a baggage car to fuel supply tanks on the locomotive, this excess oil overflowing through vent pipes in the locomotive roof and dropping into the engine-room where it was vaporized and mixed with air from the powerful ventilating fans. The fire was limited to the engine-room of one unit of the locomotive. Only one of the 900-hp. Diesel engines was damaged and that superficially, as the fire was quickly extinguished. The main generators were not affected, but considerable damage was done to electrical connections and fittings on the interior of the engine-room, also to thin steel sections such as the side sheathing. This type of fire would not occur in normal

Diesel-locomotive operation, as the provision of a reserve fuel supply on the Santa Fe test train was necessitated only by the lack of intermediate refueling facilities which will be provided when the "Super-Chief" is placed in regular service.

North Western Sales Meeting

Two sales meetings designed to develop efficiency and alertness among traffic representatives were held by the Chicago & North Western at Milwaukee, Wis., on November 18-19 and on December 2-3. Unlike the usual type of educational meeting, these meetings were designed to encourage a frank discussion of the various phases of sales work and at the same time were arranged to emphasize the facilities of the railroad for serving the public as well as the routine practices that are effective in securing business.

To bring this about, the docket included a discussion of office management, dealing with proper correspondence, efficient filing, effective telephone and telegraph messages and the proper attitude for employees to assume while contacting the public. Effective arguments on solicitation were reflected in discussions of the various gateways served by the North Western, the value of car ferry and rail service, the importance of lumber, coal, livestock, perishables and petroleum products in the North Western's traffic and pick-up and delivery service.

The need for continued effort in the solicitation of passenger business was demonstrated in the possibilities offered by winter travel, as well as convention, theatrical, resort, college and tour business. Questions of train service and equipment and advertising as an asset to solicitation were also discussed.

Certificate and Permit Forms Issued for New Motor Carriers

The Interstate Commerce Commission, Division 5, has issued this week additional forms for applications to be filed with it by motor carriers for certificates and permits under the motor carrier act. The latest forms are those to be used by common and contract carriers of property and common carriers of passengers that propose to continue operations or extensions of operations instituted between June 1 and October 15, to institute operations at any time subsequent to October 15, or to extend operations for which applications have been filed or with certificates issued by the commission. Voluminous information regarding the proposed operations is required.

Applications for certificates under the "grandfather" clause of the act, which are to be filed within 120 days from October 15, are coming in to the commission rather slowly. Although approximately half the time has now elapsed and although the commission's organization had made preparations for handling some 500 applications a day only a few hundred have so far been filed and most of them represent the smaller carriers, many of whom have failed to fill out the forms properly so that they have had to be returned.

To make room for the increasing organization of the Bureau of Motor Carriers the commission is arranging to move a

large part of the new organization to a building rented by the government for the purpose at Tenth and U streets in Washington, about two miles away from the five million dollar new building into which the commission moved last year.

Southern Pacific Runs Santa Claus Special

The Southern Pacific will operate the Santa Claus Special as an extra from Portland, Oregon, to San Francisco during the period from December 16 to 24, to accommodate anticipated heavy Christmas travel. The train will leave Portland at 3:45 p.m. and will arrive at San Francisco the following day at 1:32 p.m.

C. & E. I. to Establish New Florida Train

The Chicago & Eastern Illinois, on January 2, will place a new all Pullman, air-conditioned train in service between Chicago and Florida points on a schedule providing morning departure and evening arrival the next day. The train will leave Chicago at 8:30 a.m. and will arrive at Jacksonville, Fla., at 9:55 a.m., Miami at 5:50 p.m. and St. Petersburg at 6 p.m. Returning, it will leave St. Petersburg and Miami at 10 a.m. and Jacksonville at 6 p.m. and will arrive in Chicago at 6 p.m. the next evening.

More State Grade Crossing Programs Approved

The President has approved a partial program submitted by the Department of Highways of Minnesota including \$3,357,800 for grade crossings of the funds previously apportioned by the Secretary of Agriculture. As the total apportionment to Minnesota under the \$200,000,000 program was \$5,395,441, there remains a balance of \$2,037,641 to be covered by later programs. The program approved includes 72 projects for construction and reconstruction of grade separation structures, relocation of highways and installation of protective traffic signals.

The President has approved a partial program submitted by the State Highway Department of New Hampshire covering 12 grade crossing projects amounting to \$722,484 of the funds apportioned by the Secretary of Agriculture, leaving a balance of \$100,000 to be covered by later programs.

The President has approved a second program submitted by the Department of Public Works of Massachusetts involving 22 projects for the elimination of hazards at railroad grade crossings, which, with those previously approved, will exhaust the \$4,210,833 allocated to the state for the purpose.

He has also approved a second program submitted by the Department of Public Works of Idaho covering 38 grade crossings projects including protective devices at several places which, with these previously approved, will exhaust the \$1,674,479 allocated to the state for the purpose.

A second and final project for the District of Columbia has been approved which with a project previously approved will exhaust the \$220,804 allocated to the district for the purpose.

Plans for grade crossing projects in 42 states and the District of Columbia amounting to \$46,972,000 had been approved up to December 7, according to the Bureau of Public Roads progress report, and contracts had been awarded to the amount of \$17,930,431, including \$5,056,540 in 16 states during the week.

Bledsoe Warns People That They Must Protect Their Rights

Matters of government engage the thoughts of men now as never before, said S. T. Bledsoe, president and chairman of the executive committee of the Atchison, Topeka & Santa Fe, in a recent address at Washington and Jefferson College. Mr. Bledsoe spoke on the "challenge of the times." The occasion was the awarding to him of the degree of LL.D. by the college. In his address Mr. Bledsoe stressed the need for weighing carefully all proposed changes in our form of government, saying that "at every movement since its creation our constitution has been under scrutiny in the court of public opinion."

Almost from the beginning, he said, the fundamentals of our government have been the subject of periodical attacks which, "at the moment, seem greater in number and perhaps more persistent in appeal than ever before." "The chief threat against our institutions," he continued, "lies in that insidious danger which will arise if our citizenship, failing to weigh well the substance which lies in principles proposed to be abandoned, in eagerness for some immediate purpose, forgets the permanent value of that which would be destroyed."

"These times challenge patriotic men to see to it that the people at large shall know, for what it really is, every proposal for a change in our institutions; to strip every such proposal of all pretense or false inducement that might conceal it; to bring it about that the American people shall not barter unwittingly any part of their accustomed protection and security in exchange for anything whatsoever; and shall not act in matters so momentous without first understanding well the nature of the business and the terms of the trade."

Panama Canal Traffic

The net revenues from Panama Canal operations proper were \$14,519,506.01 in the fiscal year 1935, according to its annual report, as compared with \$16,810,348.06 last year. Net revenues from business operations under the Panama Canal for 1935 were \$1,021,216.61, as compared with \$1,366,755.12 in 1934. The combined net revenues accruing from the canal and its business units totaled \$15,540,722.62 as compared with \$18,177,103.18 in 1934. The capital investment at the beginning of the fiscal year was \$543,744,707.09, and the net revenue represented a return of 2.86 per cent on the investment, as compared with 3.37 per cent the preceding year. Except for 1934, the net earnings have fallen short each year since 1930 of returning 3 per cent on the capital investment, which is regarded as the minimum of fair return.

The foregoing figures do not include the operations carried on with funds of the Panama Railroad Company; these resulted in a net profit of \$899,195.79, as compared

with \$1,156,738.14 for the preceding year, a decrease of \$257,542.35.

Transits of ocean-going commercial vessels in 1935 numbered 5,180 as compared with 5,234 transits in the previous year, a decline of 54, or 1.1 per cent. For the year, transits through the canal averaged 14.19 per day as compared with 14.34 in 1934, 11.40 in 1933, 11.92 in 1932, 14.71 in 1931, 16.51 in 1930, and 17.23 in 1929, when traffic through the canal attained its peak. In comparison with the previous year, there also was a decline of 2.6 per cent in Panama Canal net tonnage and 3.1 per cent in tolls. On the other hand, the volume of cargo carried through the canal was higher, showing an increase of 2.5 per cent as compared with the preceding year.

Net tonnage of the ocean-going commercial vessels passing through the canal in 1935 aggregated 27,805,588 tons, Panama Canal measurement, a decrease of 2.6 per cent in comparison with 1934. Tolls in 1935 amounted to \$23,307,062.93, decreasing 3.1 per cent in comparison with the \$24,047,183.44 collected in the preceding year.

Cargo carried through the canal in 1935 amounted to 25,309,527 tons and was 2.5 per cent higher than cargo in 1934. This increase was due wholly to gains in the tonnage moving from the Atlantic to the Pacific, cargo tonnage in that direction registering an increase of 22.2 per cent in comparison with the preceding year. From the Pacific to the Atlantic there occurred a loss in cargo tonnage, the movement in this direction decreasing 4.1 per cent.

Retirement Board Seeking Registration of Furloughed Employees

The Railroad Retirement Board, charged with the administration of the railroad retirement act of 1935, has initiated steps to secure the registration of all persons who had an employment relation to a carrier on August 29, 1935. The act describes three classes of employees who are eligible for its benefits: First, those who were in active service on or after the date the law was enacted, August 29, 1935; second, official representatives of railroad employee organizations, who qualify under stated requirements; and third, persons who on August 29, 1935, were in an employment relation to a carrier, i.e., employees who were not actually in service on or since that date but who were on furlough or leave of absence, subject to call for service and ready and willing to serve, in accord with the rules and practices of railroad employment. It is this third class which the board wishes to register at this time. Registration of other classes will follow in due course.

There are approximately one and one-quarter million employees in active carrier service and some 800 persons serving in the capacity of employee representatives. The number of persons eligible to be classed as employees by reason of having an employment relation only, is not known. Such persons must be subject to call for service and must be ready and willing to serve when called. They are the persons on furlough or leave of absence who under railroad employment practices receive preference in calls to service. Such practices are frequently protected by labor agreements

and contracts in force on the property of the carriers. These agreements are not uniform on all carriers and may differ as between the several crafts and groups of employees on the same carrier. They involve various time limitations; a person who had an employment relation yesterday, may not have it today.

In order to secure data concerning the class of persons having an employment relation to a carrier, but who have not been in active service since the date of the enactment, the board is broadcasting a notice calling upon each such person to send in his name and address to the board in order that the board may forward to him forms on which registration may be made. Some of the persons who have an employment relation but are not now in active service may be eligible to receive an annuity as soon as annuity payments become due and payable, 90 days after the effective date of the act, which is March 1, 1936.

There will be a large number of other employees under the act who will be eligible to receive an annuity at the same time. The board is making arrangements to furnish annuity application forms to all persons who are eligible, on which forms they may apply for an annuity and also supply the pertinent information required to determine the amount of the annuity.

The board has been handicapped by its lack of funds caused by the failure to pass the third deficiency bill.

J. B. Hill Shows Railroads Have Met Country's Needs

J. B. Hill, president of the Louisville & Nashville, was the principal speaker on December 10 at a joint meeting in Cincinnati, Ohio, of the Ohio Valley Transportation Advisory Board, the Traffic Club of Cincinnati and the Cincinnati Chamber of Commerce Forum. Asking the question "Have the railroads failed?" Mr. Hill proceeded to prove that they have not, showing in this connection how the price, quality and extent of their service have been right and how they have contributed to the country's development. Only in the matter of granting a fair return to their investors, he found, have they "partially failed."

Inquiring into the reasons for this "partial failure," Mr. Hill listed the depression as the major cause, but he found also other important adverse influences, such, for example, as restrictive regulatory policies, inequality of competition in transport and subsidies enjoyed by railway competitors.

Concluding his remarks, Mr. Hill said, in part:

"Now, as to the remedy and what do we want you to do. We want to get more understanding into lawmakers and have railroads treated on a business basis. We would prefer a broad transport policy which will prevent discrimination and the production of excess transport facilities, with much of the restrictive influence removed from rail transportation. Specifically, we want subsidies to other forms of transportation stopped. We want commercial users of highways, waterways and airways to fall under regulation as to rates, services, hours of employment to the extent that railroads are, if such regulation is to

continue on railroads; and also to pay in tolls a service charge for what the taxpayer has provided for them. We want the Government to get out of the transportation business in the inland waterways. We want to run our own business for a while. Being treated in all other respects as a public utility, we want relief from so great taxation, or else we want all other forms to contribute equally to the functions of government. We want repeal of at least Section 7-B of the emergency transportation act. We want the long and short haul clause of the fourth section of the present law repealed. We want the recent pension bill repealed. We do not want destructive laws as will again be advocated in the next Congress, such as the full crew bill, the train limit bill, the six-hour day bill and the track and signal inspection bill. These, in a competitive world, we do not believe are in the interest of the employees themselves, because they will destroy the railroads and drive the business to other forms of transportation, to a further reduction in railroad employment.

"Then what will the railroads do? They would like to reduce grades and curves, build better bridges, lay heavier rail, fully ballast track, install automatic signals, buy new shop machinery and tools, scrap hundreds of thousands of old freight cars for better cars of lighter weight and greater net carrying capacity; replace many passenger cars with lighter cars, air-condition passenger equipment as fast as the art will economically admit; buy new and improved locomotives, which are so greatly improved over many now in use. All to the end of an improved and faster passenger and freight service. Given a revival in general business and an equal chance and an increased earning power, I shall not be ashamed of railroad performance."

C. N. R. Trustee Set-Up Questioned by Howe

(Continued from page 796)

operating officer, the Act providing that "the president shall report and be responsible to the trustees, and to them alone."

He was referring to the principle only, Mr. Howe said. "I do not wish it to be inferred that I have, as minister, any lack of confidence in the operating president of the Canadian National. Neither the government nor the minister of railways has any desire, nor any intention, to interfere with the operation of the Canadian National. It is recognized that only trained and experienced railway men should be in charge of such operation, but, in the larger sphere of direction and control of management and policies, it has been only too evident in recent years that the interests of the Canadian National have suffered by the arrangement under which the late government delegated its responsibilities."

Here the minister referred to the duty of the present government "to seek some more suitable and satisfactory system of direction and control."

"While the Canadian National and

Canadian Pacific Railway Act which created the trustees, provides for co-operation between the two railways, even to the extent of making that co-operation compulsory," said Mr. Howe, "no important measures of co-operation have taken place since the trustee board took control." He said that he favored co-operation that did not involve scrambling the properties, but did not believe the right sort of co-operation could be brought about by compulsion.

Equipment and Supplies

FREIGHT CARS

Pennsylvania Orders 10,000 Freight Cars; 4,000 from Builders

The Pennsylvania has ordered 10,000 new freight cars—6,000 from its own shops and 4,000 from outside builders. The program, work on which will be gotten under way as soon as practicable, will involve an expenditure of approximately \$25,000,000; and it is called "one of the most important and extensive equipment building programs ever undertaken in the road's history."

Included in the orders are 4,700 standard steel box cars, 3,000 automobile cars, 2,000 mill type gondolas of an entirely new design and 300 hopper cars, designed especially for the handling of cement and similar commodities in bulk. Only box cars have been ordered from outside builders, while the P. R. R. shops will also build 700 of these in addition to all those of other types.

The orders were distributed as follows:

Builder and Plant	No. of Cars
P. R. R. Shops, Altoona, Pa.....	3,300
P. R. R. Shops, Enola, Pa.....	1,350
P. R. R. Shops, Pitsa, Pa.....	1,350
Pressed Steel Car Co., McKees Rocks, Pa.....	1,000
American Car & Foundry Co., Berwick, Pa.....	800
Pullman Standard Car Manufacturing Co., Butler, Pa.....	700
Bethlehem Steel Co., Johnstown, Pa.....	600
General American Car Co., East Chicago, Ind.....	400
Greenville Steel Car Co., Greenville, Pa.....	250
Ralston Steel Car Co., Columbus, Ohio.....	250

The 3,000 new automobile cars have been designed in co-operation with the automotive industry to meet its latest requirements. Included will be 2,000 50-ton automobile box cars, 300 of which will be equipped with loading devices. These will be 40 ft. 6 in. long, 10 ft. 5 in. high and 9 ft. 2 in. wide, with double side doors. There will be also 1,000 50-ton auto cars, 50 ft. 6 in. in length, with double side doors, especially designed not only for automobiles but for the movement of automobile accessories and other materials light in weight but requiring an especially long car body. End doors will be provided in 300 of these cars. The 4,700 box cars will be of 50 tons' capacity, 40 ft. 6 in. long, 10 ft. high and 9 ft. 2 in. wide, with single side doors. The gondolas are to be of 70 tons' capacity, 52 ft. long, 9 ft. 6 in. wide

and with sides 3 ft. 6 in. high; they will be designed especially for the handling of long structural shapes and other mill products. The covered hoppers will be of 70 tons' capacity.

The program is expected to provide approximately 11,000,000 man-hours of work in equipment company and railroad shops, both in the fabrication of cars and in the production of materials necessary for their construction. It is estimated that in the work of fabrication alone, employment for a full year will be given to 2,000 men. An additional 6,000 men will be engaged over a long period in the basic industries, producing various materials. The job is expected to be completed in approximately a year.

Milwaukee Repairs Back to Normal Schedule

For the first time since 1931, the Milwaukee, Wis., shops of the Chicago, Milwaukee, St. Paul & Pacific on December 5 resumed their normal freight and passenger car repair schedule which calls for the repair of all passenger equipment during a two-year cycle and all freight equipment on a four-year cycle. As a result, 1,200 men will be employed on a 40-hr. week to repair 2 passenger and 20 freight cars a day.

Santa Fe Budget

Directors of the Atchison, Topeka & Santa Fe have approved a budget for 1936 providing for the expenditure of \$28,408,973. The major items are as follows:

500 50-ton single sheathed box cars.....	\$1,250,000
50 70-ton hopper cars.....	150,000
Car improvements.....	1,449,665
Locomotive improvements.....	220,294
Change of line work.....	2,000,000
Topeka shops.....	139,118
Widening cuts and fills.....	293,107
Ballast.....	229,401
Rails, track material and labor for 333 miles.....	3,601,302
Bridges, trestles and culverts.....	438,313
Elimination of grade crossings.....	54,000
Grade crossing and crossing signals.....	11,833
Additional yard tracks, sidings and industrial tracks.....	188,157
Signaling and interlocking plants.....	61,130
Telephone and telegraph lines.....	41,200
Roadway machinery and tools.....	113,609
Section houses and other buildings.....	6,500
Station and office buildings.....	52,445
Hotels and restaurants.....	104,594
Fuel stations.....	23,350
Water stations and appurtenances.....	63,913
Shop buildings, enginehouses and appurtenances.....	164,342
Shop machinery and tools.....	161,758

THE BARTOX PIPE LINE COMPANY has ordered 20 tank cars of 50 tons' capacity from the General American Tank Car Corporation.

IRON AND STEEL

THE SOUTHERN PACIFIC is considering the purchase of 40,769 tons of rails.

WABASH.—Receivers for this road were authorized by the federal district court on December 11 to purchase 10,000 tons of rail and fastenings at a cost of \$563,010.

AIR CONDITIONING

THE NEW YORK CENTRAL has received bids for air-conditioning equipment for 25 to 40 coaches and 25 to 40 dining cars.

Supply Trade

Wilmer H. Cordes has been appointed manager of sales promotion and advertising of the American Steel & Wire Company, Chicago.

The Gould Storage Battery Corporation has moved its eastern sales and service depot from 796 Tenth avenue to 549 West Fifty-second street, New York City.

John S. Gregg, formerly of the Moise Steel Company, Milwaukee, Wis., has been appointed to the sales staff of the Milwaukee office of the Inland Steel Company.

David C. Arthurs has been elected president and Stanley W. Butler a member of the board of the Mt. Vernon Car Manufacturing Company, Mt. Vernon, Ill., to succeed Ralph K. Weber, who has resigned as president and a director.

The Machinery & Welder Corporation, 240 South Boyle avenue, St. Louis, Mo., has been granted a selling franchise by the Caterpillar Tractor Company, Peoria, Ill., for sales of electric welding units to railroads and other corporations in Illinois, Missouri, Kansas, eastern Iowa, southern Wisconsin, northwestern Indiana and the upper peninsula of Michigan. The welding units covered by the franchise consist of General Electric generators mounted on Caterpillar track-type tractors and driven by the tractor engine through V-belts and a rear power take-off.

OBITUARY

Irwin S. Rosenfels, advertising director of the Celotex Company, died in Oak Park, Ill., on December 1, of heart failure.

William M. Ballard, contractor, who has carried out the construction of many important structures on the New York Central and the West Shore lines, including the Solvay, N. Y., engine terminal, died on November 28, at his home in Syracuse, N. Y. At the time of his death Mr. Ballard was building the new station of the New York Central at Syracuse.

Construction

DENVER & SALT LAKE.—A contract has been awarded to the Roberts & Schaefer Company, Chicago, for the construction at Denver, Colo., of a 200-ton, all-steel coal-ling station for the handling of two kinds of coal.

NEW YORK CENTRAL-DELAWARE, LACKAWANNA & WESTERN.—The New York Public Service Commission has directed the elimination of the South Geddes street crossings of these roads in Syracuse, N. Y. The crossings were ordered eliminated by depressing the streets and partially elevating the railroads in accordance with the plan filed by the Syracuse Grade Crossing

Commission. The estimated cost of the elimination is \$500,000. The plan approved is a modification of a plan previously submitted by the Syracuse Commission.

PENNSYLVANIA.—The New Jersey Board of Public Utility Commissioners has issued an order directing the elimination of the grade crossing at Deans Road and closing the grade crossing at Black Horse Lane, at Deans, N. J. This is to be accomplished by changing the lines and carrying the Deans Road highway under the railroad and building a new highway diverting Black Horse Lane to connect with the new relocated highway at Deans. The cost of the work is estimated at \$183,000, exclusive of land to be acquired.

TERMINAL RAILROAD ASSOCIATION OF ST. LOUIS.—The lowest bid for the work of constructing the foundations, reinforced concrete piers, abutments and approach fills for the South Valley Junction approach to the railroad deck of the St. Louis Municipal bridge across the Mississippi river was submitted to the St. Louis Board of Public Service by the Fruin-Colnon Contracting Company, St. Louis. The low bid was \$62,560.

TROY UNION.—The New York Public Service Commission has directed the elimination of 24 grade crossings of the Troy Union in the business section of Troy, N. Y., at an estimated cost of more than \$5,000,000. The crossings are to be eliminated by raising the grade of the Troy Union and carrying it over the streets. The Troy Union is owned by the New York Central, the Delaware & Hudson and the Boston & Maine; it owns the Union passenger station in Troy and has a double track railroad about two miles in length through a business and residence section of the city.

Financial

BLISSFIELD.—Acquisition and Operation.—The Interstate Commerce Commission has authorized the Blissfield Railroad Company to acquire and operate that part of the line formerly owned by the Toledo & Western extending from Adrian, Mich., to its intersection with the Detroit, Toledo & Ironton at Riga, 12.5 miles. The company has been authorized to issue \$34,500 of capital stock to be delivered to the Joseph Schonthal Company, scrap dealers, in payment for the property to be acquired.

BOSTON & MAINE.—Abandonment.—The Interstate Commerce Commission has authorized this company to abandon that part of its so-called Suncook loop extending from a point near Hooksett, N. H., easterly across the Merrimac river, 1,200 ft.

BOSTON & MAINE.—Equipment Trust Certificates.—A banking group headed by Whiting, Weeks & Knowles, Inc., is offering, subject to the approval of the Interstate Commerce Commission, \$2,-

670,000 of 3½ per cent equipment trust certificates of this company at prices to yield from 1.27 per cent to 3.24 per cent. The issue, which matures in instalments from 1936 to 1944, it is stated, represents not more than 50 per cent of the purchase price of the equipment involved.

CHICAGO & NORTH WESTERN.—Abandonment.—Charles P. Megan, trustee, has applied to the Interstate Commerce Commission for authority to abandon 6.3 miles of the Pence branch in Wisconsin.

CHICAGO & NORTH WESTERN.—Abandonment.—The Interstate Commerce Commission has authorized this company and its trustee to abandon a branch line extending 2.1 miles westward from Jeffris Junction, Wisc.

CHICAGO & NORTH WESTERN.—Abandonment.—The Interstate Commerce Commission has authorized this company and its trustees to abandon a branch line extending northward 6.9 miles from Cadiz, Mich.

CHICAGO, BURLINGTON & QUINCY.—Abandonment.—The Interstate Commerce Commission has authorized this company to abandon that portion of its line extending from Clarinda, Iowa, westerly to Norwich, 13.5 miles.

CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC.—Abandonment.—Examiner Molster of the Interstate Commerce Commission has recommended in a proposed report that the commission authorize the abandonment of the branch line from Brampton, N. D., to Cogswell, 7.49 miles.

CHICAGO, ROCK ISLAND & PACIFIC.—Abandonment.—The Interstate Commerce Commission has authorized the trustees of this company to abandon a portion of its Seneca-Waupoose branch between the easterly terminus of the branch and Langham, Ill., 2.6 miles.

CHICAGO, ROCK ISLAND & PACIFIC.—Committee Reorganization Plan Found Impracticable.—The Interstate Commerce Commission, Division 4, has issued a report finding "prima facie impracticable" a plan of reorganization, filed by a protective committee for preferred stockholders proposing a consolidation of the systems of the Rock Island, the St. Louis-San Francisco and the Chicago & Eastern Illinois. The report points out that the proposal would require a further modification of the commission's consolidation plan, that there is no evidence before it that any of the carriers favors such a consolidation, and that, since the committee's plan has the endorsement of a small group of creditors of only one of the corporations which it affects, the possibility of obtaining its acceptance and confirmation by some 50 classes of creditors of the three companies and three separate courts is extremely remote. The commission therefore concludes that it should not permit the issues involved in reorganization of the debtor to be broadened to include the consolidation question presented by the committee's plan.

CHICAGO, SOUTH SHORE & SOUTH BEND.—Re-organization.—The Interstate Com-

merce Commission has fixed \$500 as the maximum monthly compensation to be paid to Claude J. Jackson as trustee of this property and \$600 as the maximum monthly compensation for John C. Lawyer, counsel.

FORT WORTH & DENVER CITY.—Bonds.—This company has applied to the Interstate Commerce Commission for authority to issue \$8,176,000 of first mortgage 4½ per cent for the purpose of redeeming a like amount of 5½ per cent bonds. It is proposed to sell the bonds to the Reconstruction Finance Corporation.

NEW YORK CENTRAL.—Kanawha & Michigan Acquisition.—The Interstate Commerce Commission has authorized the Kanawha & Michigan to acquire the property and franchises of the Point Pleasant Bridge Company with a bridge and line 0.74 mile long at Point Pleasant, W. Va.

NEW YORK, ONTARIO & WESTERN.—Trackage Rights.—The Interstate Commerce Commission has authorized this company to operate under trackage rights over the Delaware, Lackawanna & Western from a point known as Cayuga Junction, in Scranton, Pa., to Pittston Junction, 10.3 miles.

PENNSYLVANIA.—Equipment Trust Certificates.—This road on December 11 asked bids, receivable December 16, from a number of banking firms on \$18,420,000 of equipment trust certificates to aid in the financing of its \$25,000,000 car-building program, which is outlined in the "Equipment and Supplies" columns of this issue. Bidders are asked to quote on certificates bearing either 3 per cent or 2¾ per cent interest, the final choice of rate to lie with the company, with the award subject to Interstate Commerce Commission approval. Costs of the program not covered by the proceeds of this issue will be met by the railroad out of its own funds.

PITTSBURGH & LAKE ERIE.—Extra Dividend.—Directors have declared an extra dividend of \$1.00 in addition to the regular \$1.25 semi-annual dividend on the common stock of this company.

UNION PACIFIC.—Acquisition.—The Interstate Commerce Commission has authorized the acquisition by this company of control of the Laramie, North Park & Western, a short line extending from Laramie, Wyo., to Coalmont, Colo., 111.35 miles, by purchase of its stock for \$650,000. The acquisition is pursuant to a condition attached by the commission when it authorized the unification of the Union Pacific system by lease of its principal subsidiaries.

VIRGINIAN.—Bonds.—The Interstate Commerce Commission has authorized this company to procure the authentication and delivery of \$3,710,000 of first mortgage, 50-year, 4½ per cent, series B bonds in reimbursement for capital expenditures.

WASHINGTON & OLD DOMINION RAILROAD.—Acquisition.—This company has applied to the Interstate Commerce Commission for authority to acquire and operate the property of the Washington & Old Dominion Railway which it has re-

cently purchased at a foreclosure sale, and the old company has applied for authority to abandon operation.

Average Prices of Stocks and of Bonds

	Dec. 10	Last week	Last year
Average price of 20 representative railway stocks..	42.10	41.73	36.01
Average price of 20 representative railway bonds..	75.98	74.83	75.08

Dividends Declared

Lackawanna R. R. of New Jersey.—\$1.00, payable January 2 to holders of record December 6.

Nashville & Decatur.—7½ Per cent Guaranteed, 93¼¢, payable January 2 to holders of record December 12.

Virginian.—\$2.00, payable December 30 to holders of record December 20.

Railway Officers

EXECUTIVE

H. R. Kurrie, president of the Chicago, Indianapolis & Louisville, and **H. D. Pettibone**, president of the Chicago Title & Trust Company, were appointed trustees of that railroad by the federal district court at Chicago on December 10.

OPERATING

Walter S. Higgins, division engineer of the Victoria division of the Texas & New Orleans (Southern Pacific Lines in Texas & Louisiana), who has been appointed superintendent of the same division, as noted in the *Railway Age* of November 30, was born on September 15, 1884, near Bastrop, Tex. Mr. Higgins graduated from the Texas Agricultural & Mechanical College in 1907 with the degree of bachelor of science in civil engineering, and entered railway service shortly after his graduation as a chainman in the engineering department of the Gulf, Colorado & Santa Fe, at Beaumont, Tex. In August, 1908, Mr. Higgins went with the San Antonio & Aransas Pass (now part of the T. & N. O.), serving with this company as a rodman at Yoakum, Tex., until September, 1909, when he went with the Galveston, Harrisburg & San Antonio (now also part of the T. & N. O.), as an estimator-draftsman at Victoria, Tex. In June, 1912, he was advanced to roadmaster, being further promoted to division engineer in October, 1916. He was holding the latter position at the time of his recent promotion to superintendent, effective December 1. Since 1909, Mr. Higgins has been located at Victoria.

FINANCIAL, LEGAL AND ACCOUNTING

M. Eckert, auditor of the Gulf Coast Lines, has been appointed general auditor of this company and the International-Great Northern, with headquarters as before at Houston, Tex. **R. H. Bunnell**, assistant auditor of the International-

Continued on next left-hand page

PASSENGER SERVICE

Can Show a Profit



Passenger train performance that attracts the traveler fills up the train and increases net income. « « « The first essential for such service is increased speed. Increased speed requires high drawbar horsepower. « « « At least one-third more drawbar horsepower can be obtained from a modern locomotive compared with one ten years old or more and having the same driving wheel loading.

LIMA LOCOMOTIVE WORKS, INCORPORATED, LIMA, OHIO



Great Northern, has been appointed auditor, with headquarters as before at Palestine, Tex., succeeding **William J. Werner**, deceased. The G. C. L. and the I-G. N. are both units of the Missouri Pacific Lines.

Ernest Alexander, secretary of the Canadian Pacific, with headquarters at Montreal, Que., will retire under the pension rules of the company on December 31. **Frederick Bramley**, until recently representative of the company in the North of Ireland, has been appointed secretary, effective January 1, succeeding Mr. Alexander. Mr. Alexander was born at Yorkshire, England, on December 8, 1862, and received his education at Collegiate Institute, Hamilton, Ont. He entered railway service in 1882 as clerk for the Grand Trunk (now Canadian National) at Hamilton, Ont., serving in this capacity until 1892. Mr. Alexander entered the service of the Canadian Pacific in 1893 as private secretary to the president and in 1899 he became chief clerk in the president's office. In 1908 he became assistant treasurer of the Canadian Pacific and in 1912 assistant secretary at Montreal. Mr. Alexander has been secretary at Montreal since January, 1917.

TRAFFIC

Charles H. Slayman, assistant industrial commissioner of the Pere Marquette, with headquarters at Detroit, Mich., has been appointed industrial commissioner, succeeding **George D. Moffett**.

W. O. Doyle, traveling agent for the Minneapolis & St. Louis at Oskaloosa, Ia., has been appointed to the newly-created position of general agent, traffic department, with the same headquarters.

F. J. Conrad, foreign freight agent for the Western Pacific, with headquarters at San Francisco, Cal., has been appointed to the newly-created position of export and import agent for the Chicago, Burlington & Quincy, with headquarters at Chicago.

J. T. Neavill, traveling freight and passenger agent on the Chicago, Burlington & Quincy at Hastings, Nebr., has been appointed assistant general livestock agent, lines west of the Missouri river, with headquarters at Denver, Colo., succeeding **Oscar C. Swan**, deceased.

Ambrose J. Seitz, general freight and passenger agent on the Union Pacific at Kansas City, Mo., has been promoted to assistant traffic manager, with headquarters at Salt Lake City, Utah, to succeed **John L. Amos**, who has retired, effective January 1. **E. J. Hanson**, assistant to freight traffic manager, with headquarters at Omaha, Neb., has been appointed to the newly-created position of assistant freight traffic manager in charge of perishable freight traffic, with the same headquarters. **J. D. Whitmore**, general livestock agent at Omaha, has been appointed to the newly-created position of assistant freight traffic manager in charge of livestock and packing house products traffic. **R. G. Owen**, assistant to freight traffic manager at San Francisco, Cal., has been

appointed to the newly-created position of assistant freight traffic manager handling the solicitation of perishable freight traffic in California. Mr. Owen's headquarters will remain at San Francisco. **W. T. Price**, assistant general freight and passenger agent at Denver, Colo., has been promoted to the newly-created position of general freight and passenger agent, with the same headquarters.

John F. Pewters, assistant freight traffic manager of the Great Northern, with headquarters at St. Paul, Minn., who has been promoted to western traffic manager, with headquarters at Seattle, Wash., as noted in the *Railway Age* of December 7, was born at St. Paul and entered service with the Great Northern during summer vacations while attending high school. He served as a water boy, messenger, car



John F. Pewters

sealer and clerk until 1915, when he was made agent at Minneapolis Junction, being appointed assistant agent at Great Falls, Mont., in the following year. In 1920, Mr. Pewters was promoted to general

agent at Great Falls, being transferred to Spokane, Wash., two years later. In 1925 he was advanced to assistant general freight and passenger agent for Montana, with headquarters at Helena, and on June 15, 1930, he was made assistant general freight agent at St. Paul. On June 15, 1932, Mr. Pewters was further promoted to assistant freight traffic manager, with the same headquarters, which position he was holding at the time of his recent promotion to western traffic manager, which was effective on December 1.

MECHANICAL

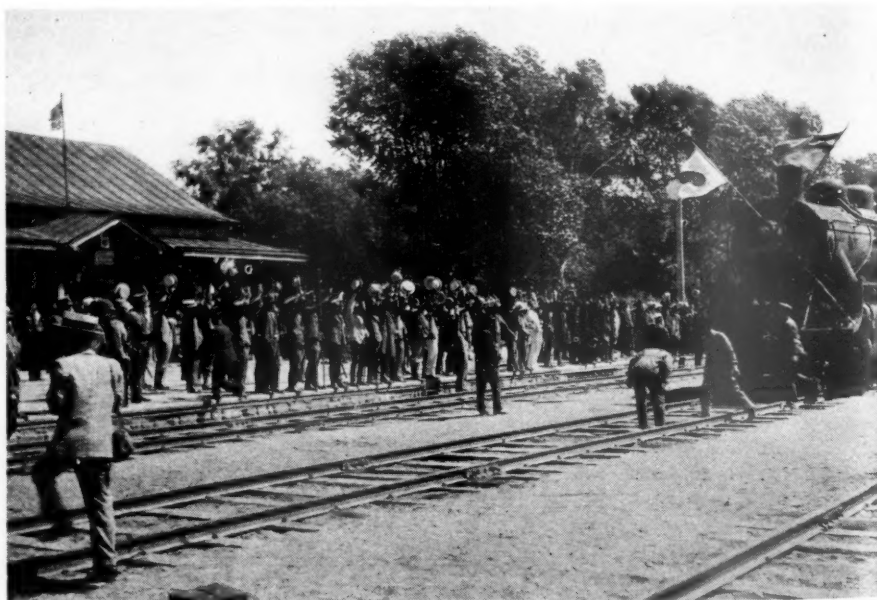
E. L. Bachman, master mechanic of the Pennsylvania, with headquarters at Harrisburg, Pa., has been appointed acting superintendent motive power of the Eastern and Central Pennsylvania division, succeeding **H. H. Haupt**.

OBITUARY

R. K. Graham, general superintendent of reclamation of the Atchison, Topeka & Santa Fe, with headquarters at Corwith (Chicago), Ill., died on December 3 of a heart attack. Mr. Graham, who was a native of Pennsylvania, was 72 years of age and had been connected with the Santa Fe since 1894. He had directed the company's reclamation activities at Corwith since 1904.

L. M. Allen, district manager of the Western Weighing and Inspection Bureau, with headquarters at Minneapolis, Minn., died on November 29, following a brief illness. Mr. Allen was born on June 21, 1869, in New York state, and entered the service of the Western Weighing and Inspection Bureau in 1893, as a clerk in the St. Paul office. Later he served as district superintendent at Des Moines, Iowa, and Omaha, Neb., and had served as district manager at Minneapolis since 1929.

* * *

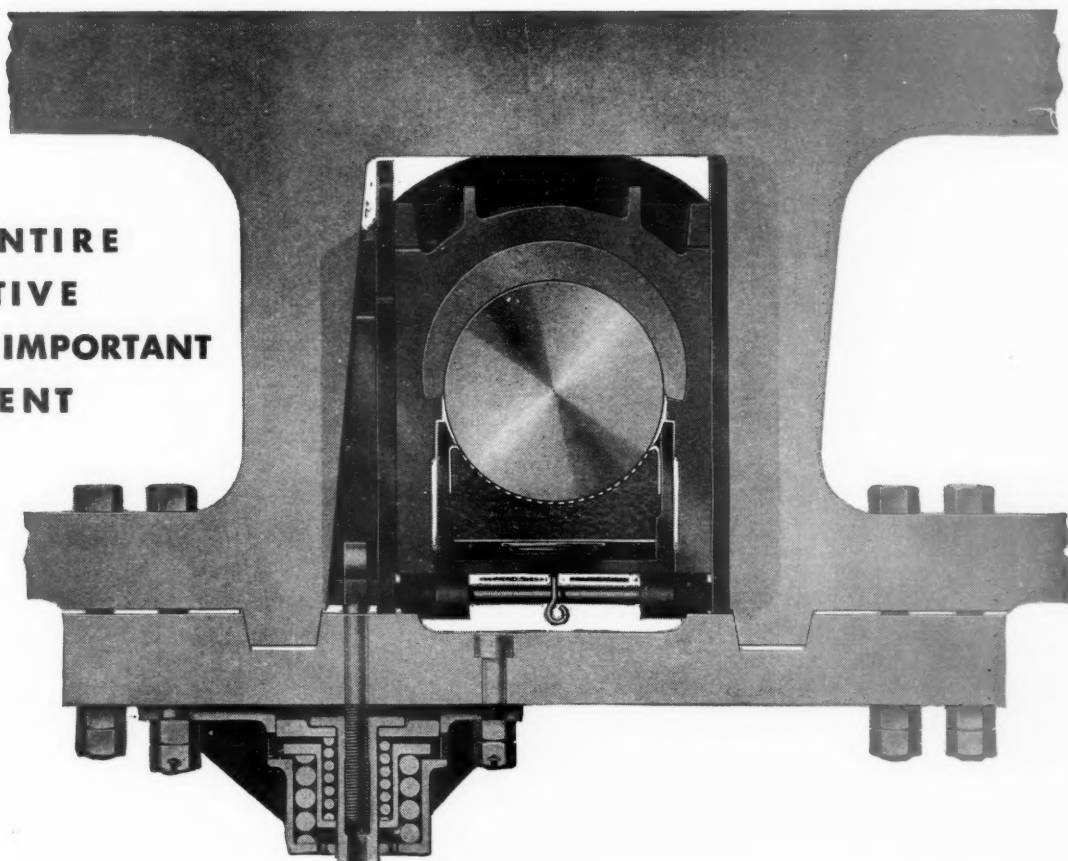


When the State Railways of Manchoukuo Changed the Gauge of 149 Miles of Line Between Harbin and Hsinking on August 31, in 2 Hr. and 50 Min., as Reported in the *Railway Age* of that Date—Photo shows Trial Train Arriving at Taolaichao

Tables of Revenues and Expenses of Railways begin on next left-hand page

DRIVING BOX FIT

**ON THE ENTIRE
LOCOMOTIVE
THE MOST IMPORTANT
ADJUSTMENT**



A stuck box causes hard riding, and excessive strain on all the motion work and frames — slack between box and frame causes a pound which quickly hammers all bearings out of shape and sends the locomotive to the back-shop ahead of its time.

Franklin Automatic Compensator and Snubber compensates for box expansion due to temperature change and compensates for all other operating conditions. It has

ample reserve strength to take care of the high piston thrust of large locomotives and at the same time there is no chance for tight or stuck boxes.

It constantly maintains accurate driving box adjustment, increases locomotive mileage between shoppings and greatly prolongs the life of every bearing on the locomotive. It is the shock absorber for the locomotive.



Booster Repair Parts made by the jigs and fixtures that produced the original are your best guarantee of satisfactory performance.

FRANKLIN RAILWAY SUPPLY COMPANY, INC.

NEW YORK

CHICAGO

MONTREAL

Revenues and Expenses of Railways

MONTH OF OCTOBER AND TEN MONTHS OF CALENDAR YEAR 1935

MONTH OF OCTOBER AND TEN MONTHS OF CALENDAR YEAR 1935														
Name of road	Av. mileage operated during period	Operating revenues				Operating expenses				Operating ratio	Net from railway operation	Net railway operating income		
		Freight	Passenger	Total	Maintenance of way and structures	Equip-ment	Traffic	Trans-portion	Total			Operating income	After depr. & retir. 1935	Before depr. & retir. 1934
Atlanta, Canton & Youngstown.....	Oct. 171	\$180,442	\$48	\$180,490	\$37,066	\$18,352	\$9,149	\$50,744	\$123,581	65.0	\$66,447	\$58,928	\$42,434	\$15,041
Atlanta, Canton & Youngstown.....	10 mos. 171	1,546,729	384	1,547,113	257,850	176,924	83,466	508,267	1,098,171	67.4	531,410	453,879	309,604	234,595
Atlanta, Canton & Youngstown.....	Oct. 949	1,048,134	156,835	1,204,969	168,317	223,459	46,624	504,886	999,143	71.4	400,506	328,703	147,274	50,522
Atlanta, Canton & Youngstown.....	10 mos. 949	8,432,911	1,434,486	9,867,397	11,486,426	2,207,646	467,614	4,638,749	9,827,912	85.6	1,658,514	949,200	637,957	280,435
Atlanta, Topeka & Santa Fe System.....	Oct. 13,260	11,572,516	1,051,857	12,624,373	13,760,119	3,152,305	388,460	4,437,328	10,433,819	75.8	3,326,300	2,277,252	2,341,269	1,495,393
Atlanta, Topeka & Santa Fe System.....	10 mos. 13,260	89,788,678	11,215,366	101,004,044	151,666,533	27,419,696	3,937,502	39,850,008	89,872,943	80.9	21,286,048	12,524,365	12,393,721	13,969,432
Atlanta, Topeka & Santa Fe System.....	Oct. 93	112,725	19,623	132,348	15,744	27,204	7,512	60,311	120,643	76.9	36,211	25,932	12,362	12,362
Atlanta, Topeka & Santa Fe System.....	10 mos. 93	905,031	196,991	1,102,022	186,752	254,796	72,266	548,490	1,156,122	88.8	145,351	77,736	49,118	119,255
Western of Alabama.....	Oct. 133	95,187	22,123	117,310	19,343	28,375	7,128	50,443	113,519	84.6	20,604	12,495	16,277	7,327
Western of Alabama.....	10 mos. 133	766,440	200,942	967,382	219,653	295,577	69,181	482,873	1,147,254	102.6	29,171	11,047	67,295	39,040
Atlanta, Birmingham & Coast.....	Oct. 639	216,049	7,877	223,926	47,972	48,726	16,627	97,975	236,552	93.1	17,629	5,231	4,980	6,596
Atlanta, Birmingham & Coast.....	10 mos. 639	2,136,270	80,412	2,216,682	419,160	460,715	208,899	989,820	2,325,268	92.8	179,299	53,221	77,154	254,290
Atlantic Coast Line.....	Oct. 5,145	2,292,439	282,247	2,574,686	303,279	677,864	113,969	1,230,225	2,474,180	83.4	493,899	338,482	340,705	115,978
Atlantic Coast Line.....	10 mos. 5,147	23,941,615	4,790,788	28,732,403	4,053,556	6,844,243	1,169,631	13,125,357	26,841,572	81.7	5,995,962	2,635,038	1,972,191	3,276,467
Atlantic Coast Line.....	Oct. 342	158,707	1,039	159,746	27,626	24,432	5,881	13,125	46,812	71.6	46,748	27,248	37,700	29,234
Atlantic Coast Line.....	10 mos. 342	1,575,075	132,225	1,707,300	259,744	271,442	60,335	537,314	1,198,871	73.4	433,832	272,440	271,949	319,540
Baltimore & Ohio.....	Oct. 6,444	12,226,886	826,769	13,053,655	1,260,158	2,862,684	378,944	4,475,573	9,659,393	69.6	4,223,100	3,651,339	3,088,975	1,999,673
Baltimore & Ohio.....	10 mos. 6,440	102,404,503	8,165,514	110,570,017	101,892,322	25,990,636	3,714,824	41,574,284	87,363,700	74.0	30,738,363	24,585,362	20,432,609	26,348,672
Baltimore & Ohio.....	Oct. 23	73,845	1,039	74,884	134,066	11,945	205,828	83,832	132,671	99.1	1,195	17,305	38,734	33,818
Baltimore & Ohio.....	10 mos. 23	416,648	73,845	490,493	1,251,650	125,189	205,828	827,665	1,305,630	104.3	53,980	224,488	429,704	123,038
Bangor & Aroostook.....	Oct. 603	480,634	12,145	492,779	76,213	84,567	5,677	120,377	313,919	61.2	198,884	149,863	161,088	263,054
Bangor & Aroostook.....	10 mos. 603	4,710,310	124,044	4,834,354	512,803	512,803	58,074	1,206,334	3,359,342	65.5	1,770,532	1,328,793	1,345,678	1,346,995
Bessemer & Lake Erie.....	Oct. 225	1,022,621	768	1,023,389	635,620	117,666	11,233	173,772	813,871	59.6	418,680	366,730	462,163	462,163
Bessemer & Lake Erie.....	10 mos. 225	8,268,811	7,146	8,275,957	8,368,830	958,731	116,079	1,539,049	5,468,899	65.3	2,899,931	2,363,019	2,569,001	1,459,214
Brooklyn Eastern District Terminal.....	Oct. 2,000	2,898,756	473,051	3,371,807	3,906,826	458,441	621,172	1,527,493	2,859,063	73.2	1,047,763	833,229	672,362	715,954
Brooklyn Eastern District Terminal.....	10 mos. 2,018	25,545,887	5,589,865	31,135,752	36,285,587	4,500,357	631,794	14,817,947	27,600,839	70.1	8,684,748	6,647,416	4,995,338	4,908,123
Burlington-Rock Island.....	Oct. 10,91	100,721	.....	100,721	7,112	8,279	234	26,909	47,929	52.6	416,810	340,821	341,836	290,522
Burlington-Rock Island.....	10 mos. 10,91	852,710	.....	852,710	49,024	94,155	2,126	255,026	456,247	52.6	16,810	16,810	16,810	16,810
Burlington-Rock Island.....	Oct. 255	105,542	2,913	108,455	115,136	13,887	4,448	44,934	86,843	75.4	28,293	24,004	9,872	8,377
Burlington-Rock Island.....	10 mos. 273	615,727	38,936	654,663	147,110	143,616	43,222	412,081	821,183	116.2	114,747	179,400	277,371	225,643
Cambria & Indiana.....	Oct. 37	127,552	.....	127,552	127,720	4,391	109,719	13,555	133,601	104.6	5,881	17,797	41,571	4,337
Canadian Pacific Lines in Maine.....	Oct. 37	912,684	.....	912,684	914,188	62,016	464,489	3,476	115,249	702,261	76.82	211,927	31,534	695,599
Canadian Pacific Lines in Maine.....	10 mos. 233	105,281	12,058	117,339	129,754	39,227	30,673	8,998	55,136	141,949	109.4	12,195	22,195	33,593
Canadian Pacific Lines in Vermont.....	Oct. 233	1,262,943	153,261	1,416,204	1,551,745	358,404	353,779	92,400	613,274	96.0	60,875	3,135	183,747	49,578
Canadian Pacific Lines in Vermont.....	10 mos. 85	52,297	6,420	58,717	74,800	20,186	209,335	4,183	550,323	997,204	128.2	219,297	269,298	.....
Central of Georgia.....	Oct. 1,926	1,170,964	88,879	1,259,843	1,400,645	279,314	51,213	510,196	1,035,551	74.5	355,333	282,057	262,483	141,569
Central of Georgia.....	10 mos. 1,926	9,728,097	1,019,953	10,748,050	12,077,026	2,558,916	522,900	4,326,951	10,222,225	84.6	1,884,801	1,222,527	823,187	560,346
Central of Georgia.....	Oct. 684	2,072,807	331,003	2,403,810	445,057	445,057	42,740	55,169	1,800,390	69.7	784,689	1,237,546	121,891	279,994
Central of Georgia.....	10 mos. 684	19,348,512	3,689,430	23,037,942	4,559,569	4,559,569	462,016	10,286,148	17,830,257	72.3	6,842,649	3,351,261	2,170,695	2,698,589
Central Vermont.....	Oct. 455	401,070	26,037	427,107	85,441	73,735	15,225	228,070	426,599	90.4	43,574	27,335	10,965	13,613
Central Vermont.....	10 mos. 455	3,698,198	338,530	4,036,728	723,413	863,467	143,599	2,079,802	4,007,141	89.7	476,297	312,769	189,976	48,814
Chesapeake & Ohio.....	Oct. 3,110	11,085,809	260,480	11,346,289	1,126,583	1,737,640	179,746	2,358,914	5,768,117	49.1	4,980,597	4,899,370	4,945,916	3,513,840
Chesapeake & Ohio.....	10 mos. 3,112	87,919,501	2,354,634	90,274,135	9,906,428	16,660,787	1,807,615	21,294,247	52,627,369	56.3	41,061,375	32,138,257	31,980,282	30,976,548
Chicago & Eastern Illinois.....	Oct. 938	1,039,852	81,133	1,120,985	1,281,643	138,844	202,903	51,597	470,120	922,502	72.0	359,141	308,183	173,324
Chicago & Eastern Illinois.....	10 mos. 938	8,657,062	907,677	9,564,739	10,227,552	1,388,904	1,870,881	518,431	4,441,175	80.6	2,124,010	1,570,775	351,217	381,273
Chicago & Eastern Illinois.....	Oct. 131	288,969	881	297,850	30,348	50,348	53,533	16,558	70,813	207,706	69.7	90,125	76,695	82,729
Chicago & Illinois Midland.....	Oct. 131	2,632,785	10,172	2,642,957	2,725,601	347,431	163,055	697,889	1,932,669	70.9	792,632	686,045	710,105	633,150
Chicago & North Western.....	Oct. 8,428	6,329,717	604,668	6,934,385	7,768,456	1,170,643	1,444,511	156,625	2,875,036	5,967,094	76.8	1,801,362	1,059,226	1,043,119
Chicago & North Western.....	10 mos. 8,428	49,985,626	7,425,072	57,410,698	64,394,363	14,261,742	1,637,716	25,268,556	54,908,278	85.3	9,486,085	4,780,403	2,191,547	4,618,364
Chicago, Burlington & Quincy.....	Oct. 9,036	7,572,899	575,160	8,148,059	8,963,724	1,210,961	199,343	3,951,203	5,908,897	65.9	3,054,827	2,521,586	2,115,455	1,936,224
Chicago, Burlington & Quincy.....	10 mos. 9,036	54,777,671	5,720,048	60,497,719	67,964,889	10,361,613	12,344,132	2,178,823	25,274,655	78.8	14,428,320	9,294,519	5,982,422	10,426,462
Chicago Great Western.....	Oct. 1,514	1,420,897	52,287	1,473,184	1,601,256	223,869	203,816	53,628	2,875,036	1,095,859	68.4	505,397	252,214	157,588
Chicago Great Western.....	10 mos. 1,512	11,484,300	431,252	11,915,552	12,870,364	1,875,504	1,957,077	544,301	5,108,151	77.7	2,874,789	2,328,271	1,974,040	1,015,728
Chicago, Indianapolis & Louisville.....	Oct. 647	654,313	45,207	700,520	795,709	71,877	183,048	27,492	302,401	615,560	77.4	1,167,121	935,226	330,825
Chicago, Indianapolis & Louisville.....	10 mos. 647	5,455,449	431,206	5,886,655	6,681,183	648,347	1,521,447	258,133	2,827,981	82.5	5,514,062	4,696,804	3,982,415	2,047,120
Chicago, Milwaukee, St. Paul & Pacific.....	Oct. 11,126	8,456,933	532,189	8,989,122	9,850,138	1,869,988	1,551,378	199,320	3,338,315	73.5	2,609,419	2,171,581	1,634,230	882,415
Chicago, Milwaukee, St. Paul & Pacific.....	10 mos. 11,130	64,032,926	4,879,905	68,912,831	76,416,544	15,280,775	2,159,919	29,519,919	29,519,919	84.4	11,594,407	6,237,175	5,833,857	6,997,156
Chicago, Milwaukee, St. Paul & Pacific.....	Oct. 7,574	4,965,926	4,553,436	9,519,362	6,113,687	745,057	1,293,132	186,876	2,451,954	82.6	1,066,041	780,884	526,467	485,008
Chicago, Rock Island & Pacific.....	Oct. 7,575	41,989,127	4,946,218	46,935,345	52,448,463	6,620,073	11,671,674	1,910,990	23,078,261	89.4	5,341,659	2,634,687	1,832,802	3,001,882

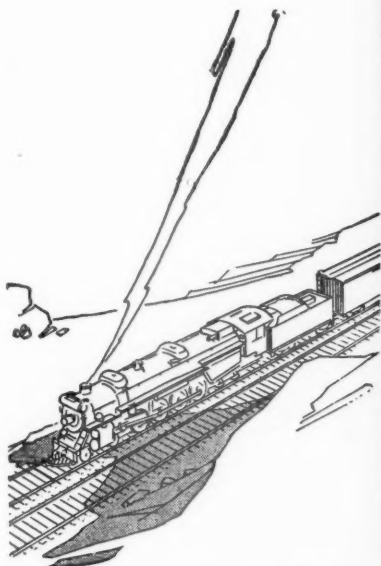
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Engineering Service....

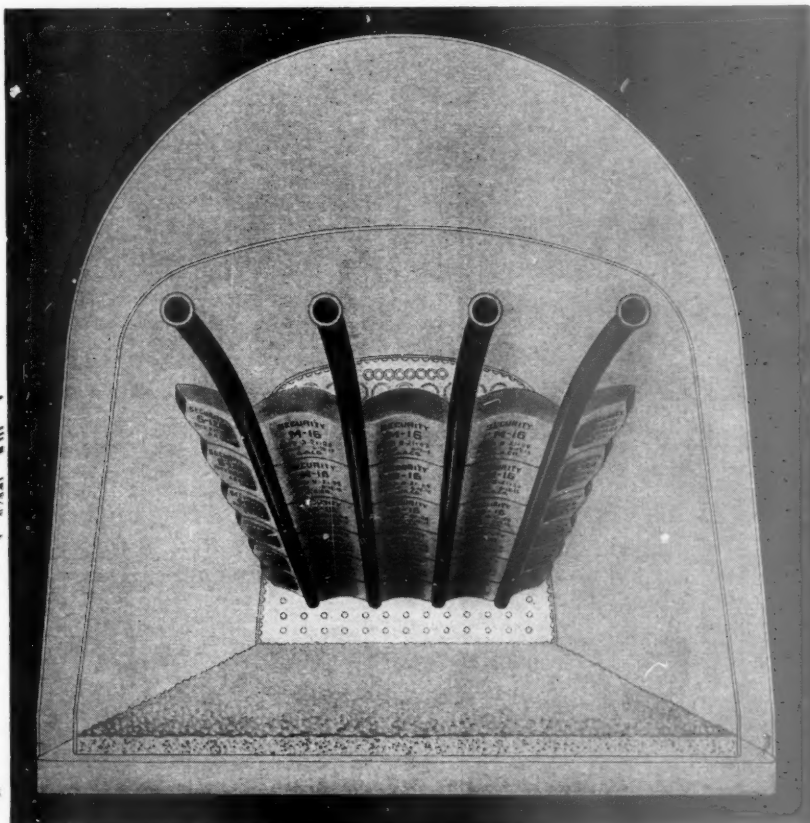
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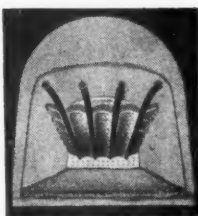


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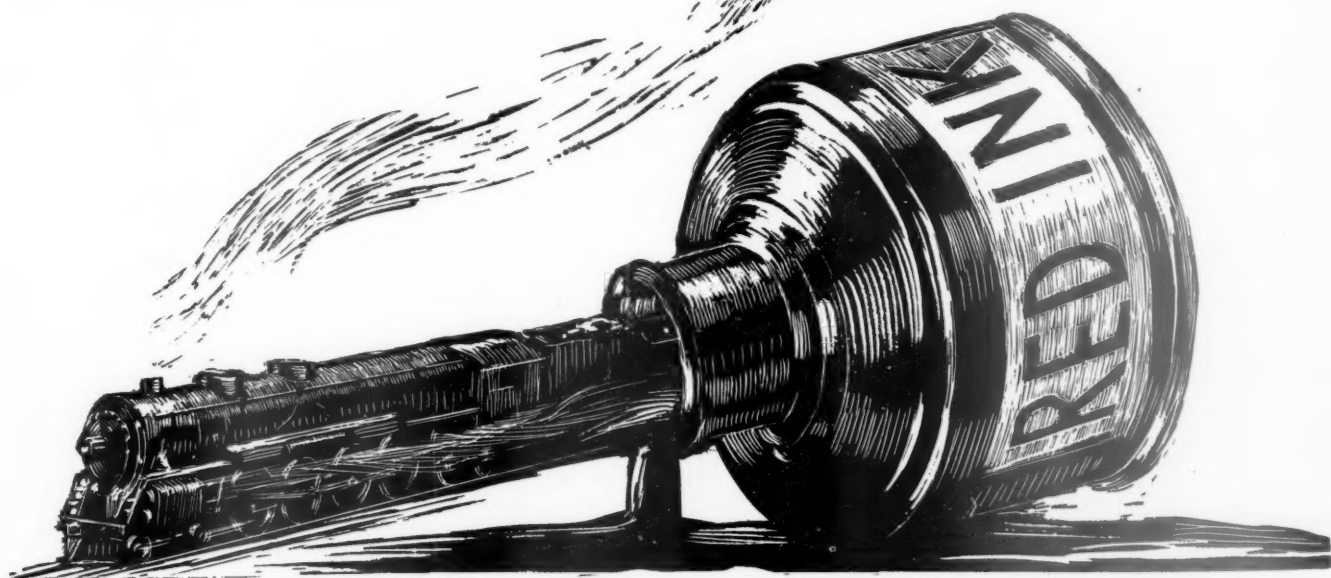
Revenues and Expenses of Railways

MONTH OF OCTOBER AND TEN MONTHS OF CALENDAR YEAR 1935—CONTINUED

MONTH OF OCTOBER AND TEN MONTHS OF CALENDAR YEAR 1935—CONTINUED															
Name of road	Av. mileage operated during period	Operating revenues			Operating expenses			Operating ratio	Net from railway operation	Net railway operating income					
		Freight	Passenger	Total	Way and structures	Maintenance of equipment	Traffic			Trans- portation	Total	Operating income	After depr. & retir. 1934	Before depr. & retir. 1935	
Chicago, Rock Island & Gulf.....	722	\$323,692	\$26,871	\$350,563	\$59,625	\$36,835	\$15,797	\$119,547	\$255,296	73.5	\$92,277	\$75,529	\$30,444	\$14,440	
Chicago, St. Paul, Minn. & Omaha.....	722	2,893,126	240,885	3,134,011	461,670	335,552	159,217	1,167,827	2,364,302	73.2	866,568	686,097	31,808	77,325	
Chicago, St. Paul, Minn. & Omaha.....	1,651	1,418,050	110,518	1,528,568	175,000	273,854	32,815	700,212	1,261,591	76.9	379,952	304,453	206,301	258,019	
Chicago, St. Paul, Minn. & Omaha.....	1,652	10,503,569	1,257,114	11,760,683	1,496,213	2,301,655	333,687	6,103,881	11,005,462	86.5	1,720,422	995,138	34,896	780,172	
Clinchfield Railroad.....	309	490,400	3,566	493,966	35,932	108,936	17,272	86,289	273,878	54.8	225,690	187,690	219,179	179,275	
Clinchfield Railroad.....	309	4,217,009	38,463	4,255,472	359,370	1,081,936	163,142	872,132	2,604,334	60.5	1,702,337	1,322,270	1,547,272	1,392,413	
Colorado & Southern.....	1,019	575,496	27,491	602,987	60,297	95,916	12,868	242,683	445,856	67.7	212,267	156,568	129,659	88,030	
Colorado & Southern.....	1,019	4,204,723	282,550	4,487,273	742,356	992,043	126,415	2,007,194	4,208,969	84.9	730,448	199,954	12,963	346,302	
Fort Worth & Denver City.....	804	472,976	35,562	508,538	45,103	78,234	16,234	168,025	342,888	57.8	230,442	226,956	183,974	89,626	
Fort Worth & Denver City.....	804	3,392,076	367,448	3,759,524	454,115	759,575	165,522	1,559,511	3,290,915	75.2	1,086,212	812,878	496,496	1,155,760	
Columbus & Greenville.....	167	109,673	6,840	116,513	122,751	19,243	14,118	3,827	36,573	83,317	67.9	39,434	34,882	31,606	4,156
Columbus & Greenville.....	167	669,730	60,480	730,210	786,579	170,114	125,383	36,800	31,235	743,501	94.5	43,078	13,978	23,360	3,107
Delaware & Hudson.....	835	1,765,523	74,312	1,839,835	302,864	553,438	49,034	740,360	1,784,620	92.5	145,722	58,657	73,882	75,760	
Delaware & Hudson.....	835	17,337,373	903,040	18,240,413	2,821,917	5,175,949	484,006	7,407,146	17,078,103	89.3	2,052,039	1,551,121	1,241,842	1,230,888	
Delaware, Lackawanna & Western.....	992	2,959,252	519,637	3,478,889	788,263	1,164,788	116,478	1,751,415	3,070,448	77.7	882,350	595,729	563,753	457,644	
Delaware, Lackawanna & Western.....	992	27,430,936	5,337,129	32,768,065	3,843,699	7,304,697	1,152,065	17,022,753	31,085,712	83.7	6,057,936	2,856,474	2,564,589	3,988,742	
Denver & Rio Grande Western.....	2,584	2,364,923	178,487	2,543,410	263,127	447,591	49,864	822,431	1,669,387	63.2	971,582	826,324	743,331	467,267	
Denver & Rio Grande Western.....	2,584	14,905,108	1,168,796	16,073,904	2,182,146	4,214,635	498,586	5,803,130	13,564,553	79.5	3,497,298	2,000,227	1,459,921	1,976,599	
Denver & Salt Lake.....	232	1,575,321	40,175	1,615,496	214,592	316,511	18,823	394,270	981,217	57.5	724,551	572,046	991,486	602,184	
Detroit & Mackinac.....	242	72,041	81,235	153,276	8,156	11,215	900	24,954	47,319	58.3	33,916	22,174	28,077	19,249	
Detroit & Mackinac.....	242	453,171	25,821	478,992	102,629	98,347	8,718	216,978	456,516	84.4	84,288	75,518	50,837	107,703	
Detroit & Toledo Shore Line.....	50	310,812	.....	310,812	20,020	31,155	7,918	72,859	139,337	44.5	173,777	147,280	93,460	43,181
Detroit & Toledo Shore Line.....	50	2,826,802	.....	2,826,802	284,737	226,837	7,955	694,364	1,321,806	46.4	1,525,591	1,278,536	793,298	610,443
Detroit, Toledo & Ironton.....	472	531,245	185	531,430	58,665	71,567	10,757	118,011	270,212	49.1	280,555	228,203	197,879	78,845	
Detroit, Toledo & Ironton.....	472	6,488,441	2,438	6,490,879	650,992	834,812	105,542	1,338,635	3,101,343	46.2	3,610,619	2,639,528	2,639,528	1,693,910	
Duluth, Missabe & Northern.....	559	1,469,638	2,565	1,472,203	1,654,952	136,215	206,726	3,300	269,984	661,700	40.0	993,232	870,635	868,383	404,490
Duluth, Missabe & Northern.....	559	9,918,736	29,976	10,018,712	1,250,354	1,795,860	34,568	2,175,696	5,619,850	49.4	5,745,210	4,792,867	4,790,844	2,740,931	
Duluth, Winnipeg & Pacific.....	178	97,660	1,854	99,514	103,133	21,569	22,854	1,710	41,795	92,275	89.5	10,878	5,716	4,319	14,806
Duluth, Winnipeg & Pacific.....	178	812,564	20,888	833,452	240,152	185,838	17,317	390,105	869,960	100.9	52,343	52,343	143,309	63,363	
Elgin, Joliet & Eastern.....	434	1,126,444	1,126,444	1,310,916	272,214	414,850	12,910	450,771	898,347	68.5	412,568	318,859	308,214	384,179
Elgin, Joliet & Eastern.....	441	10,096,532	.....	10,096,532	1,143,737	2,494,206	132,038	4,190,486	8,305,238	72.2	3,199,331	2,299,094	2,255,745	489,152
Erie Railroad.....	2,296	6,596,203	389,615	6,985,818	601,616	1,167,221	166,405	2,548,704	4,782,280	63.7	2,721,613	2,386,319	2,039,217	1,290,761	
Erie Railroad.....	2,304	53,420,955	4,072,717	57,493,672	5,926,997	11,983,103	1,650,336	23,222,002	45,801,398	73.3	16,659,276	13,400,358	10,632,445	11,268,535	
New Jersey & New York.....	45	150,159	473,977	624,136	638,875	3,416	226,010	9,338	484,196	808,314	125.6	164,812	206,333	354,161	358,138
New Jersey & New York.....	45	150,159	473,977	624,136	638,875	3,416	226,010	9,338	484,196	808,314	125.6	164,812	206,333	354,161	358,138
New York, Susquehanna & Western.....	215	242,660	23,040	265,700	278,295	37,801	42,635	4,885	121,341	219,575	78.9	58,720	36,547	282,535	339,910
New York, Susquehanna & Western.....	215	2,572,007	247,224	2,819,231	2,974,461	504,425	47,847	1,220,437	2,175,259	73.1	799,202	572,259	799,202	414,641	
Florida East Coast.....	712	298,204	62,576	360,780	410,216	101,778	121,217	19,855	1,170,197	456,572	111.3	46,356	11,410	143,788	201,185
Florida East Coast.....	792	3,866,452	1,689,268	5,555,720	1,199,636	1,345,097	207,669	2,286,183	5,550,282	87.1	824,081	113,645	277,157	171,885	
Fort Smith & Western.....	249	489,116	9,851	498,967	530,846	144,977	65,771	16,877	127,930	243,907	77.0	73,303	68,679	75,205	87,752
Fort Smith & Western.....	249	279,467	318,410	597,877	23,311	532,312	168,752	1,162,873	2,236,918	83.1	456,847	410,516	489,089	438,574	
Georgia Railroad.....	329	2,329,407	136,943	2,466,350	2,695,765	256,806	316,659	5,266	19,933	53,458	78.3	14,842	13,321	6,218	3,796
Georgia & Florida.....	408	84,296	2,763	87,059	91,520	20,451	19,137	7,924	33,821	83,932	91.7	7,588	2,992	1,305	6,141
Georgia & Florida.....	408	868,215	24,298	892,513	931,460	211,057	167,908	78,561	334,227	843,555	90.6	87,805	41,761	27,223	45,685
Grand Trunk Western.....	1,006	1,828,806	69,265	1,898,071	2,029,665	286,961	366,251	31,935	790,644	1,542,883	76.0	486,782	413,231	274,004	362,448
Grand Trunk Western.....	1,006	15,232,968	652,326	15,885,294	2,402,872	3,424,695	324,280	6,962,760	13,853,442	81.1	3,221,577	2,469,933	1,358,520	498,636	
Canadian Nat'l Lines in New Eng.....	172	85,459	4,469	90,000	98,679	32,714	32,714	2,467	61,658	115,811	117.3	17,132	17,132	76,463	84,028
Canadian Nat'l Lines in New Eng.....	172	801,827	70,130	871,957	954,060	264,386	264,386	25,195	575,997	1,159,586	121.5	318,517	318,517	691,789	684,078
Great Northern.....	8,250	10,110,608	345,492	10,456,100	11,090,541	720,202	1,215,895	171,125	697,974	5,086,924	45.9	6,003,617	5,406,704	5,184,395	2,790,768
Great Northern.....	8,283	60,042,191	3,624,284	63,666,475	6,138,357	10,510,791	1,702,174	21,442,322	41,912,523	60.6	27,245,278	21,439,513	20,150,836	11,663,664	
Green Bay & Western.....	234	129,452	765	130,217	135,835	23,077	15,770	5,090	50,494	98,221	72.3	37,614	30,594	22,463	14,910
Green Bay & Western.....	234	1,118,691	10,238	1,128,929	1,179,878	223,943	183,117	54,325	430,362	918,365	77.8	261,513	191,345	137,063	178,573
Gulf & Ship Island.....	259	836,145	8,823	844,968	883,021	15,471	12,677	2,759	40,436	94,436	89.1	164,855	148,855	22,421	6,199
Gulf & Ship Island.....	259	836,145	8,823	844,968	883,021	15,471	12,677	2,759	40,436	94,436	89.1	164,855	148,855	22,421	6,199
Gulf, Mobile & Northern.....	936	588,081	24,383	612,464	636,308	86,098	90,157	30,737	152,319	384,076	60.46	251,232	221,197	160,375	58,644
Gulf, Mobile & Northern.....	936	4,632,141	215,391	4,8											

Continued on next left-hand page

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SUPERHEATER UNIT BOLTS

Specialty Manufacturer Knows Best

An epidemic of steam leaks in the front ends of a certain class of locomotive was finally traced to shop-made bolts and studs, made of common steel, whereas the chrome-nickel steel bolts supplied by the manufacturers have a high elastic limit and don't yield and leak at high smokebox temperature. The fuel saving over a year's time would buy a lot of good bolts and studs. It stands to reason that the people who have specialized in the making of these parts are much better equipped to furnish them.

Railway Mechanical Engineer
OCTOBER, 1935 (page 433)



NEW YORK
60 East 42nd St.

MONTREAL
The Superheater Co., Ltd.
Dominion Square Bldg.

CHICAGO
Peoples Gas Bldg.

REPRESENTATIVE OF AMERICAN THROTTLE COMPANY, INC.

Revenues and Expenses of Railways

MONTH OF OCTOBER AND TEN MONTHS OF CALENDAR YEAR 1935—CONTINUED

Name of road	Av. mileage operated during period	Operating revenues				Operating expenses				Operating ratio	Net from railway operation	Net railway operating income		
		Freight	Passenger (inc. misc.)	Total	Maintenance of way and structures	Equipment	Traffic	Trans- portation	Total			Operating income	After depr. & retir. 1935	Before depr. & retir.
Nashville, Chattanooga & St. Louis.....Oct.	1,154	\$910,719	\$69,140	\$1,079,859	\$130,741	\$236,556	\$56,734	\$437,903	\$935,354	84.8	\$167,266	\$124,232	\$113,016	\$167,266
Nashville, Chattanooga & St. Louis.....10 mos.	1,177	\$8,305,217	\$773,003	\$9,078,220	\$1,371,399	\$2,469,768	\$157,157	\$4,240,827	\$9,354,827	90.7	\$952,627	\$726,317	\$726,317	\$952,627
Nevada Northern.....Oct.	1,655	\$34,264	41,112	75,376	7,278	3,578	731	9,362	24,620	59.9	14,283	11,815	14,283	14,283
Nevada Northern.....10 mos.	1,655	\$268,325	8,488	\$276,813	\$6,722	\$3,152	7,425	\$79,496	\$242,471	75.2	\$60,091	\$20,380	\$56,509	\$37,754
New York Central.....Oct.	11,330	\$20,973,130	\$4,416,505	\$25,389,635	\$2,793,702	\$5,647,598	\$49,762	\$10,235,796	\$20,633,687	71.7	\$8,158,379	\$6,088,300	\$4,772,545	\$2,422,957
New York Central.....10 mos.	11,330	\$179,488,226	\$45,266,291	\$224,754,517	\$25,602,108	\$52,904,567	\$5,358,517	\$96,238,396	\$193,816,357	76.1	\$61,015,441	\$41,651,075	\$28,534,147	\$13,116,929
Pittsburgh & Lake Erie.....Oct.	233	\$1,551,286	38,411	\$1,589,697	\$1,626,034	\$186,756	\$28,356	\$434,287	\$1,341,487	82.5	\$284,347	\$178,267	\$178,267	\$284,347
Pittsburgh & Lake Erie.....10 mos.	233	\$13,156,135	431,873	\$13,588,008	\$1,004,777	\$2,167,544	\$263,865	\$4,605,594	\$11,172,890	79.8	\$2,831,887	\$1,765,505	\$3,202,241	\$2,765,832
New York, Chicago & St. Louis.....Oct.	1,691	\$3,272,603	\$2,667	\$3,275,270	\$327,642	\$449,306	\$108,441	\$1,044,582	\$2,060,875	59.7	\$1,390,770	\$1,284,943	\$991,616	\$431,681
New York, Chicago & St. Louis.....10 mos.	1,691	\$26,657,729	\$2,667	\$26,660,396	\$2,793,702	\$5,647,598	\$49,762	\$10,235,796	\$20,633,687	71.7	\$8,158,379	\$6,088,300	\$4,772,545	\$2,422,957
New York, New Haven & Hartford.....Oct.	2,072	\$3,949,329	\$1,765,855	\$5,715,184	\$755,902	\$1,096,038	\$1,060,661	\$2,394,830	\$4,720,536	72.9	\$1,752,210	\$1,376,331	\$830,590	\$407,607
New York, New Haven & Hartford.....10 mos.	2,070	\$33,975,499	\$18,098,680	\$52,074,179	\$6,349,476	\$9,877,912	\$864,946	\$22,947,952	\$43,210,459	73.6	\$15,535,308	\$12,210,615	\$6,973,763	\$4,711,125
New York Connecting.....Oct.	20	\$216,404	.....	\$216,404	\$11,994	\$8,442	.....	\$33,515	\$54,973	23.8	\$175,890	\$141,960	\$101,183	\$79,695
New York Connecting.....10 mos.	20	\$2,145,258	.....	\$2,145,258	\$123,723	\$71,087	.....	\$326,527	\$531,175	23.5	\$1,723,247	\$1,385,187	\$1,036,227	\$796,964
New York, Ontario & Western.....Oct.	567	\$623,288	\$3,391	\$626,679	\$88,730	\$118,871	\$11,401	\$292,188	\$534,383	79.5	\$138,100	\$106,099	\$73,599	\$15,795
New York, Ontario & Western.....10 mos.	567	\$6,224,459	\$33,617	\$6,258,076	\$797,101	\$1,242,344	\$114,480	\$2,999,822	\$5,407,381	76.2	\$1,685,784	\$1,321,731	\$956,407	\$1,021,687
Norfolk & Western.....Oct.	2,166	\$7,385,969	\$146,653	\$7,532,622	\$786,541	\$1,220,553	\$118,368	\$1,615,032	\$3,870,723	50.0	\$3,877,485	\$3,164,235	\$3,508,318	\$2,085,256
Norfolk & Western.....10 mos.	2,166	\$59,955,656	\$1,493,565	\$61,449,221	\$7,158,547	\$12,169,025	\$1,196,669	\$14,814,834	\$37,193,988	58.5	\$26,361,901	\$19,378,650	\$21,363,286	\$18,459,337
Norfolk Southern.....Oct.	932	\$408,831	\$8,784	\$417,615	\$74,663	\$55,410	\$22,427	\$158,787	\$333,240	75.9	\$106,018	\$80,070	\$53,746	\$19,919
Norfolk Southern.....10 mos.	932	\$3,681,842	\$103,311	\$3,785,153	\$727,486	\$532,855	\$217,264	\$1,485,622	\$3,136,376	80.0	\$836,000	\$575,331	\$311,017	\$479,596
Northern Pacific.....Oct.	6,722	\$5,564,178	\$269,551	\$5,833,729	\$545,567	\$1,157,045	\$140,896	\$2,025,515	\$4,125,204	65.5	\$2,177,963	\$1,692,361	\$1,961,032	\$958,339
Northern Pacific.....10 mos.	6,725	\$37,555,165	\$2,906,179	\$40,461,344	\$5,501,621	\$10,351,592	\$1,564,082	\$17,094,655	\$37,541,670	84.1	\$7,087,747	\$5,250,592	\$5,234,486	\$6,322,858
Northwestern Pacific.....Oct.	375	\$231,890	\$71,572	\$303,462	\$36,610	\$46,761	\$4,097	\$174,623	\$277,254	80.2	\$68,687	\$52,214	\$41,566	\$16,104
Northwestern Pacific.....10 mos.	375	\$1,673,322	\$771,021	\$2,444,343	\$374,166	\$493,302	\$40,996	\$1,544,570	\$2,592,676	92.4	\$214,301	\$148,539	\$113,239	\$53,996
Oklahoma City-Ada-Atoka.....Oct.	132	\$30,239	\$302	\$30,541	\$6,838	\$2,314	\$793	\$11,508	\$23,704	73.0	\$8,779	\$6,413	\$3,198	\$1,130
Oklahoma City-Ada-Atoka.....10 mos.	132	\$311,809	\$3,369	\$315,178	\$27,388	\$20,500	\$7,868	\$109,329	\$228,252	63.9	\$128,995	\$109,948	\$79,933	\$3,015
Pennsylvania Railroad.....Oct.	10,473	\$26,159,475	\$5,047,451	\$31,206,926	\$2,866,590	\$6,513,775	\$595,298	\$11,414,751	\$23,178,979	97.0	\$11,391,646	\$8,512,492	\$7,765,366	\$6,815,037
Pennsylvania Railroad.....10 mos.	10,473	\$225,332,946	\$49,402,000	\$274,734,946	\$27,293,112	\$56,993,864	\$5,974,296	\$109,016,578	\$217,018,438	71.3	\$87,151,267	\$64,910,776	\$57,470,953	\$53,730,439
Long Island.....Oct.	396	\$540,705	\$1,253,260	\$1,793,965	\$176,288	\$371,335	\$46,310	\$907,250	\$1,561,712	82.4	\$333,470	\$90,875	\$92,553	\$207,782
Long Island.....10 mos.	396	\$4,773,927	\$14,324,630	\$19,108,557	\$1,717,278	\$3,515,285	\$186,971	\$9,347,879	\$15,344,879	76.6	\$4,688,162	\$2,255,992	\$2,255,992	\$1,434,133
Pennsylvania-Reading Seashore Lines.....Oct.	413	\$284,801	\$114,073	\$398,874	\$41,226	\$57,680	\$8,491	\$251,850	\$388,217	91.7	\$35,130	\$35,130	\$110,012	\$182,989
Pennsylvania-Reading Seashore Lines.....10 mos.	413	\$2,285,801	\$2,424,370	\$4,710,171	\$545,969	\$843,305	\$87,723	\$2,929,704	\$4,686,515	94.6	\$267,622	\$267,622	\$1,440,203	\$1,320,567
Pere Marquette.....Oct.	2,123	\$2,737,366	\$49,596	\$2,786,962	\$290,542	\$10,134	\$65,241	\$30,596	\$1,889,582	63.7	\$1,077,355	\$939,222	\$802,625	\$44,486
Pere Marquette.....10 mos.	2,128	\$21,194,599	\$345,455	\$21,540,054	\$2,609,775	\$4,957,186	\$625,170	\$8,368,540	\$17,503,029	75.6	\$5,638,540	\$4,638,580	\$3,604,851	\$5,757,390
Pittsburg & Shawmut.....Oct.	101	\$466,227	\$3,764	\$470,000	\$102,457	\$157,683	\$15,703	\$166,418	\$471,565	108.5	\$3,093	\$817	\$1,532	\$9,824
Pittsburg & Shawmut.....10 mos.	101	\$4,662,227	\$37,644	\$4,699,871	\$1,024,571	\$1,576,833	\$157,683	\$1,664,418	\$4,715,565	98.7	\$6,260	\$4,595	\$35,218	\$93,860
Pittsburgh & West Virginia.....Oct.	138	\$295,163	.....	\$295,163	\$31,082	\$70,412	\$15,390	\$57,455	\$194,933	63.0	\$114,628	\$92,374	\$125,874	\$62,654
Pittsburgh & West Virginia.....10 mos.	138	\$2,332,494	.....	\$2,332,494	\$263,677	\$565,428	\$136,097	\$509,817	\$1,684,234	68.4	\$777,877	\$591,041	\$833,694	\$729,311
Pittsburg, Shawmut & Northern.....Oct.	190	\$9,507	\$31	\$9,538	\$16,398	\$13,490	\$1,300	\$25,911	\$63,447	104.0	\$-4,422	\$-4,422	\$-4,781	\$-2,284
Pittsburg, Shawmut & Northern.....10 mos.	190	\$732,619	\$1,315	\$733,934	\$168,640	\$163,035	\$13,657	\$297,821	\$706,732	92.0	\$61,578	\$39,740	\$-8,702	\$-67,573
Reading.....Oct.	1,459	\$4,237,448	\$268,644	\$4,506,092	\$334,044	\$743,438	\$73,919	\$1,741,270	\$3,057,982	64.8	\$1,659,574	\$1,310,859	\$1,398,038	\$1,067,253
Reading.....10 mos.	1,459	\$38,026,102	\$2,463,279	\$40,489,381	\$3,322,256	\$7,362,396	\$757,520	\$16,609,328	\$30,600,279	70.5	\$12,594,655	\$9,530,410	\$9,530,410	\$12,552,489
Richmond, Fredericksburg & Potomac.....Oct.	117	\$233,310	\$98,383	\$331,693	\$63,196	\$117,454	\$8,797	\$212,633	\$41,079	94.1	\$27,789	\$11,392	\$11,186	\$3,923
Richmond, Fredericksburg & Potomac.....10 mos.	117	\$2,870,356	\$1,380,887	\$4,251,243	\$559,080	\$1,230,870	\$86,511	\$2,269,544	\$4,524,313	83.9	\$865,283	\$609,349	\$270,339	\$313,865
Rutland.....Oct.	407	\$195,094	\$1,147	\$196,241	\$47,381	\$54,586	\$10,997	\$138,344	\$267,166	91.8	\$23,809	\$4,102	\$2,213	\$-8,591
Rutland.....10 mos.	407	\$1,803,480	\$33,057	\$1,836,537	\$469,524	\$552,252	\$108,454	\$1,351,429	\$2,628,923	97.2	\$74,867	\$121,788	\$114,633	\$1,349
St. Louis-San Francisco.....Oct.	4,929	\$3,410,979	\$219,917	\$3,630,896	\$643,577	\$940,308	\$100,367	\$1,352,314	\$3,209,309	80.9	\$757,924	\$512,668	\$524,700	\$233,792
St. Louis-San Francisco.....10 mos.	4,989	\$28,379,379	\$2,164,667	\$30,544,046	\$6,154,991	\$8,430,067	\$1,016,375	\$12,708,599	\$29,651,579	88.2	\$3,931,506	\$1,379,867	\$1,498,476	\$3,065,233
Fort Worth & Rio Grande.....Oct.	233	\$41,803	\$1,077	\$42,880	\$13,680	\$11,027	\$2,304	\$25,216	\$55,411	112.2	\$-6,044	\$-7,268	\$-10,184	\$-16,954
Fort Worth & Rio Grande.....10 mos.	233	\$295,807	\$11,819	\$307,626	\$116,303	\$99,895	\$24,282	\$233,410	\$501,908	135.6	\$-131,718	\$-169,257	\$-214,483	\$-221,187
St. Louis, San Francisco & Texas.....Oct.	261	\$102,138	\$685	\$102,823	\$37,842	\$20,778	\$5,344	\$41,205	\$113,354	104.9	\$-5,306	\$-7,337	\$-13,788	\$-48,200
St. Louis, San Francisco & Texas.....10 mos.	261	\$866,875	\$5,507	\$872,382	\$329,375	\$174,094	\$49,661	\$397,205	\$1,013,007	111.3	\$-102,976	\$-139,912	\$-386,235	\$-413,483
St. Louis Southwestern Lines.....Oct.	1,778	\$1,342,390	\$16,725	\$1,359,115	\$147,122	\$201,402	\$72,964	\$450,150	\$939,378	65.9	\$485,673	\$407,921	\$312,898	\$265,359
St. Louis Southwestern Lines.....10 mos.	1,784	\$12,218,847	\$166,677	\$12,385,524	\$1,463,382	\$1,768,971	\$721,143	\$4,266,271	\$8,884,499	68.6	\$4,068,171	\$3,223,814	\$2,019,342	\$1,810,671
San Diego & Arizona Eastern.....Oct.	145	\$25,974	\$4,271	\$30,245	\$14,571	\$7,025	\$2,000	\$19,768	\$48,464	140.4	\$-13,944	\$-23,342	\$-23,342	\$-19,925
San Diego & Arizona Eastern.....10 mos.	145	\$285,584	\$58,292	\$343,876	\$113,186	\$69,590	\$18,435	\$198,879	\$452,007	115.9	\$-62,140	\$-98,672	\$-86,627	\$-33,763

Continued on next left-hand page

"I know of no other system of handling trains where the same benefits could be derived"



—says the Signal Engineer of a Class I railroad in commenting upon an installation of "Union" Centralized Traffic Control. " " " " " " "

Double track portions of the controlled territory are equipped for either-direction operation by signal indication. "The dispatcher handling the signals and switches can make a great many moves in his effort to handle trains promptly that could not have been made when handling trains by train order." For instance, if a freight leaves a given point a few minutes before a passenger train, both trains can be routed on tracks so as not to cause delay to either of them or to any train approaching in the opposite direction.

saving considerable time to all trains involved. " " " " " " "

Our nearest district office will be glad to explain in detail how "Union" C.T.C. makes possible the statement of this signal engineer that "even with the light traffic as at present the last minute can be used or taken advantage of under C.T.C. operation that would not be possible under train order operation."



1028

1881

Union Switch & Signal Co.

1935

SWISSVALE, PA.

NEW YORK

MONTREAL

CHICAGO

ST. LOUIS

SAN FRANCISCO

Revenues and Expenses of Railways

MONTH OF OCTOBER AND TEN MONTHS OF CALENDAR YEAR 1935—CONTINUED

Name of road	Av. mileage operated during period	Operating revenues				Operating expenses				Operating ratio	Net from railway operation	Net railway operating income	
		Freight	Passenger	Total	Inc. misc.	Way and structures	Maintenance of equipment	Traffic	Trans-shipment			After depr. & retir. 1935	Before depr. & rel. 1934
Seaboard Air Line.....	4,307	\$2,318,175	\$219,534	\$2,537,709	\$2,537,709	\$2,537,709	\$2,537,709	\$2,537,709	\$2,537,709	90.2	\$282,085	\$67,190	\$224,894
10 mos.	4,307	22,022,339	2,858,778	24,881,117	24,881,117	24,881,117	24,881,117	24,881,117	24,881,117	85.6	4,027,934	1,289,948	2,737,986
Southern Railway	6,644	6,483,344	645,564	7,128,908	7,128,908	7,128,908	7,128,908	7,128,908	7,128,908	67.6	2,554,558	1,850,065	704,493
10 mos.	6,644	54,984,487	6,795,847	61,780,334	61,780,334	61,780,334	61,780,334	61,780,334	61,780,334	74.5	17,305,950	13,000,559	4,305,391
Alabama Great Southern.....	315	423,707	43,002	466,709	466,709	466,709	466,709	466,709	466,709	76.0	122,014	70,392	51,622
10 mos.	315	3,562,062	449,264	4,011,326	4,011,326	4,011,326	4,011,326	4,011,326	4,011,326	84.1	695,640	313,278	382,362
Cinn., New Orleans & Texas Pacific, Oct.	336	1,133,003	55,319	1,188,322	1,188,322	1,188,322	1,188,322	1,188,322	1,188,322	58.1	527,398	432,079	95,319
10 mos.	336	9,860,517	661,701	10,522,218	10,522,218	10,522,218	10,522,218	10,522,218	10,522,218	64.8	3,938,095	2,963,606	974,489
Georgia Southern & Florida.....	397	128,734	22,223	150,957	150,957	150,957	150,957	150,957	150,957	90.9	15,419	2,751	12,668
10 mos.	397	1,158,368	254,224	1,412,592	1,412,592	1,412,592	1,412,592	1,412,592	1,412,592	90.2	155,393	29,002	126,391
New Orleans & Northeastern.....	204	190,286	16,782	207,068	207,068	207,068	207,068	207,068	207,068	65.6	77,648	32,745	44,903
10 mos.	204	1,618,063	175,811	1,793,874	1,793,874	1,793,874	1,793,874	1,793,874	1,793,874	73.6	514,096	283,574	230,522
Northern Alabama	99	41,170	1,689	42,859	42,859	42,859	42,859	42,859	42,859	70.9	13,192	9,394	3,798
10 mos.	99	425,944	17,285	443,229	443,229	443,229	443,229	443,229	443,229	65.3	160,347	102,817	57,530
Southern Pacific	8,785	10,191,207	1,486,259	11,677,466	11,677,466	11,677,466	11,677,466	11,677,466	11,677,466	65.3	4,449,933	3,477,579	972,354
10 mos.	8,788	78,165,745	14,695,050	92,860,795	92,860,795	92,860,795	92,860,795	92,860,795	92,860,795	73.0	27,819,504	19,248,218	8,571,286
Southern Pacific Steamship Lines.....	.....	408,271	4,784	413,055	413,055	413,055	413,055	413,055	413,055	111.6	49,657	50,105	-1,448
10 mos. ....	.....	3,701,518	139,687	3,841,205	3,841,205	3,841,205	3,841,205	3,841,205	3,841,205	111.7	461,886	469,985	-8,099
Texas & New Orleans.....	4,431	2,786,918	244,133	3,031,051	3,031,051	3,031,051	3,031,051	3,031,051	3,031,051	70.9	1,000,139	842,893	157,246
10 mos.	4,438	22,660,912	2,367,353	25,028,265	25,028,265	25,028,265	25,028,265	25,028,265	25,028,265	82.7	4,871,350	2,780,982	2,090,368
Spokane, Portland & Seattle.....	522	539,987	38,679	578,666	578,666	578,666	578,666	578,666	578,666	54.4	282,531	233,997	48,534
10 mos.	522	4,392,940	419,811	4,812,751	4,812,751	4,812,751	4,812,751	4,812,751	4,812,751	56.2	2,261,764	1,757,356	504,408
Tennessee Central	286	209,629	4,784	214,413	214,413	214,413	214,413	214,413	214,413	65.4	78,847	68,391	10,456
10 mos.	286	1,696,514	52,970	1,749,484	1,749,484	1,749,484	1,749,484	1,749,484	1,749,484	71.0	538,754	381,173	157,581
Texas & Pacific.....	1,949	1,807,800	195,378	2,003,178	2,003,178	2,003,178	2,003,178	2,003,178	2,003,178	62.5	848,934	692,025	156,909
10 mos.	1,949	15,221,335	1,726,254	16,947,589	16,947,589	16,947,589	16,947,589	16,947,589	16,947,589	68.7	6,016,809	4,962,360	1,054,449
Texas Mexican	162	77,370	787	78,157	78,157	78,157	78,157	78,157	78,157	84.6	13,655	9,555	4,100
10 mos.	162	891,655	4,361	896,016	896,016	896,016	896,016	896,016	896,016	72.4	277,239	235,889	41,350
Toledo, Peoria & Western.....	239	191,162	4	191,166	191,166	191,166	191,166	191,166	191,166	61.8	73,979	63,755	10,224
10 mos.	239	1,795,989	149	1,796,138	1,796,138	1,796,138	1,796,138	1,796,138	1,796,138	76.2	358,228	305,213	53,015
Union Pacific	3,589	7,195,819	564,302	7,760,121	7,760,121	7,760,121	7,760,121	7,760,121	7,760,121	59.2	3,404,119	3,056,043	348,076
10 mos.	3,593	48,474,827	5,153,877	53,628,704	53,628,704	53,628,704	53,628,704	53,628,704	53,628,704	74.4	15,077,513	10,835,848	4,241,665
Oregon Short Line.....	2,504	2,584,062	159,144	2,743,206	2,743,206	2,743,206	2,743,206	2,743,206	2,743,206	57.5	1,226,123	1,027,009	199,114
10 mos.	2,504	17,274,227	1,237,910	18,512,137	18,512,137	18,512,137	18,512,137	18,512,137	18,512,137	68.0	6,351,333	4,219,773	2,131,560
Oregon-Wash. R. R. & Nav. Co.....	2,248	1,482,331	140,189	1,622,520	1,622,520	1,622,520	1,622,520	1,622,520	1,622,520	66.1	596,184	484,907	111,277
10 mos.	2,269	11,279,382	1,172,068	12,451,450	12,451,450	12,451,450	12,451,450	12,451,450	12,451,450	78.7	2,944,803	1,716,559	1,228,244
Los Angeles & Salt Lake.....	1,249	1,317,300	158,560	1,475,860	1,475,860	1,475,860	1,475,860	1,475,860	1,475,860	59.4	652,217	547,900	104,317
10 mos.	1,248	11,036,767	1,702,804	12,739,571	12,739,571	12,739,571	12,739,571	12,739,571	12,739,571	67.5	4,528,952	3,430,688	1,098,264
St. Joseph & Grand Island.....	288	350,573	3,191	353,764	353,764	353,764	353,764	353,764	353,764	45.1	197,807	172,662	25,145
10 mos.	288	2,337,924	25,136	2,363,060	2,363,060	2,363,060	2,363,060	2,363,060	2,363,060	62.9	904,956	806,111	98,845
Utah	111	155,375	.....	155,375	155,375	155,375	155,375	155,375	155,375	51.1	75,980	66,212	9,768
10 mos.	111	1,773,995	.....	1,773,995	1,773,995	1,773,995	1,773,995	1,773,995	1,773,995	72.0	217,252	126,766	90,486
Virginian	619	1,622,811	2,892	1,625,703	1,625,703	1,625,703	1,625,703	1,625,703	1,625,703	38.4	1,032,854	842,854	190,000
10 mos.	619	12,578,878	34,274	12,613,152	12,613,152	12,613,152	12,613,152	12,613,152	12,613,152	45.9	7,095,705	5,520,627	1,575,078
Wabash	2,447	3,416,039	208,851	3,624,890	3,624,890	3,624,890	3,624,890	3,624,890	3,624,890	71.2	1,088,390	933,055	155,335
10 mos.	2,447	30,101,277	1,823,757	31,925,034	31,925,034	31,925,034	31,925,034	31,925,034	31,925,034	76.2	8,148,975	6,795,295	1,353,680
Ann Arbor	293	3,266,557	27,131	3,293,688	3,293,688	3,293,688	3,293,688	3,293,688	3,293,688	66.7	762,715	636,510	126,205
10 mos.	293	26,663,557	273,665	26,937,222	26,937,222	26,937,222	26,937,222	26,937,222	26,937,222	76.7	6,303,842	4,626,211	1,677,631
Western Maryland	883	1,259,806	6,393	1,266,199	1,266,199	1,266,199	1,266,199	1,266,199	1,266,199	68.6	406,806	331,806	75,000
10 mos.	883	11,803,888	68,388	11,872,276	11,872,276	11,872,276	11,872,276	11,872,276	11,872,276	74.9	3,649,558	3,014,558	634,999
Western Pacific	1,213	1,714,888	46,848	1,761,736	1,761,736	1,761,736	1,761,736	1,761,736	1,761,736	61.2	694,853	641,387	53,466
10 mos.	1,213	9,959,275	328,134	10,287,409	10,287,409	10,287,409	10,287,409	10,287,409	10,287,409	83.5	1,749,819	1,165,525	583,294
Wheeling & Lake Erie.....	511	1,264,459	1,139	1,265,598	1,265,598	1,265,598	1,265,598	1,265,598	1,265,598	66.2	456,444	353,416	103,028
10 mos.	511	10,412,876	13,937	10,426,813	10,426,813	10,426,813	10,426,813	10,426,813	10,426,813	74.9	2,789,981	1,967,010	822,971
Wichita Falls & Southern.....	203	49,161	65	49,226	49,226	49,226	49,226	49,226	49,226	72.7	14,186	8,866	5,320
10 mos.	203	422,552	390	422,942	422,942	422,942	422,942	422,942	422,942	72.5	128,238	78,225	50,013